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UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF TENNESSEE  
NASHVILLE DIVISION

JOHN RUFFINO and MARTHA  
RUFFINO, Husband and  
Wife,  
  
Plaintiffs,  
  
Civil Action No.  
3:17-cv-00725  
  
v.  
  
Jury Demand  
DR. CLARK ARCHER and HCA  
HEALTH SERVICES OF  
TENNESSEE, INC. D/b/a  
STONECREST MEDICAL  
CENTER,  
  
Defendants.  
  
DEPOSITION OF ALFRED CALLAHAN, III, M.D.  
April 18, 2018  
  
Deposition of ALFRED CALLAHAN, III,  
M.D., taken at the offices of Dr. Callahan,  
2000 Glen Echo Road, Suite 122, Nashville,  
Tennessee, at 1 p.m. (CST) on the above date  
before Stephanie A. Faulkner, LCR, CRI, CPE,  
Tennessee Licensed Court Reporter, pursuant  
to the Federal Rules of Civil Procedure.

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A P P E A R A N C E S

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ALFRED CALLAHAN, III, M.D.,  
having been first duly sworn, testified as  
follows:  
  
DIRECT EXAMINATION  
BY MR. GIDEON:  
Q. Dr. Callahan, my turn to ask you  
questions.  
A. Yes, sir.  
Q. Three things for you to keep in  
mind. First, listen to the question and  
don't answer if you don't understand it,  
okay?  
A. Yes.  
Q. Number two, answer it directly.  
Don't start explaining it before you answer  
it. Just answer it directly, then if you  
need to explain it, I'll never cut you off.  
Third, if you need to check on a  
patient, respond to a call, anytime, just let  
me know and we'll pause.  
A. For the second, I'll try. For the  
third, yes. Thank you.  
Q. Well, I know you'll have to try,  
but I'll probably have to remind you, too, to  
answer the question directly before you begin

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1 an explanation. If I do that, I hope you  
2 won't be offended.  
3 A. I will not be.  
4 Q. Okay. Have you done all you need  
5 to do to form your opinions in this case?  
6 A. Yes.  
7 Q. Okay. When were you first engaged?  
8 And you're free to look at this, if you wish  
9 to, the first contact.  
10 A. It's my recollection that  
11 Mr. Cummings called me in August of last  
12 year, 2017.  
13 Q. What did he ask you to do?  
14 A. To look at a case.  
15 Q. All right. Did you know it had  
16 already been filed?  
17 A. I don't know if he told me that,  
18 so...  
19 Q. Now, there is a letter in those  
20 materials that's dated in December of 2017,  
21 if you could put your hands on that. And I  
22 think that is the first written communication  
23 that's dated in those materials. Will you  
24 check and see if that's correct? I think  
25 it's clipped on the outside of that envelope.

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1 A. I believe you're right.  
2 Q. What's the date?  
3 A. Of that letter?  
4 Q. Yes.  
5 A. 08 December '17.  
6 MR. GIDEON: We'll make the  
7 December 8, 2017 letter Exhibit 1.  
8 (Whereupon, the above-mentioned  
9 document was marked as Exhibit No. 1 to the  
10 testimony of the witness.)  
11 BY MR. GIDEON:  
12 Q. What was included with the letter  
13 of December 8th, 2017 in terms of substantive  
14 materials for you to review?  
15 A. My recollection was that I had  
16 gotten a CD of imaging with the letter.  
17 Q. Okay. Was the imaging limited to  
18 the CT scan and the CTA at StoneCrest?  
19 A. No. There were -- there were two  
20 discs. So one was from StoneCrest with  
21 imaging and the other was from Centennial  
22 with imaging.  
23 Q. All right. Okay. As I mentioned  
24 to you before we began the deposition, I  
25 swear your handwriting has gotten actually

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1 smaller as the years have gone by, and it  
2 started off small to begin with.  
3 Did you prepare any notes as you  
4 reviewed the imaging at StoneCrest and the  
5 imaging at Centennial?  
6 A. Yes, sir, I did.  
7 Q. All right. I think probably the  
8 best thing to do is for you to identify your  
9 notes that address your reviews of the  
10 imaging. We'll exhibit those notes. And I  
11 know there's a separate pages, Dr. Callahan,  
12 of notes where you describe imaging at  
13 Tennova, which it appears you got later,  
14 right?  
15 A. Yes. I received that very  
16 recently.  
17 Q. Right. And by that, we're  
18 referring to the December 23, 2015, MRI and  
19 MRA at University Medical Center in Lebanon,  
20 correct?  
21 A. Yes.  
22 Q. Okay. Any other recent imaging you  
23 received?  
24 A. No.  
25 Q. By the way, have you ever received

Page 8

1 a copy of the affidavit of Jodi Dodds, the  
2 vascular neurologist at Duke?  
3 A. I don't recall if -- I think I may  
4 have read that electronically.  
5 Q. Do you think you did?  
6 A. I think I did.  
7 Q. Okay. Have you seen the disclosure  
8 of opinion testimony by Jodi Dodds and a  
9 Dr. Zazulia from Washington University in  
10 St. Louis on our behalf?  
11 A. I don't recall that.  
12 Q. Okay. All right. In any event,  
13 let's get back to the notes. How many pages  
14 of notes do you have just describing the  
15 imaging?  
16 A. One page.  
17 Q. Front and back?  
18 A. No. Just this side.  
19 MR. GIDEON: Okay. We're going to  
20 make this one page that he's going to be  
21 reading from an exhibit. We'll make this one  
22 page Exhibit 2.  
23 (Whereupon, the above-mentioned  
24 document was marked as Exhibit No. 2 to the  
25 testimony of the witness.)

<p style="text-align: right;">Page 9</p> <p>1 BY MR. GIDEON:</p> <p>2 Q. Now, Dr. Callahan, would you just</p> <p>3 read your notes, please, of the</p> <p>4 interpretation of the imaging? Tell us what</p> <p>5 study you're looking at first, and then tell</p> <p>6 us what you thought of it.</p> <p>7 A. The page begins, Ruffino imaging;</p> <p>8 CD, StoneCrest. CT head plain 2/17/16 1027</p> <p>9 hours. Calcification of the left vertebral</p> <p>10 artery, right internal carotid artery, and a</p> <p>11 large cisterna magna. No hyperdense MCA. No</p> <p>12 certain changes.</p> <p>13 Q. Okay.</p> <p>14 A. Want me to continue?</p> <p>15 Q. Is that it as far as the CT scan</p> <p>16 that was done at approximately 10:30 in the</p> <p>17 morning?</p> <p>18 A. Yes.</p> <p>19 Q. Okay. Now, what about the CTA in</p> <p>20 the afternoon?</p> <p>21 A. The notes goes on to say, CTAH,</p> <p>22 slash, N; head and neck; 2/17/16. It was</p> <p>23 obtained at 1409 hours. Plaque in the left</p> <p>24 bifurcation slice 66 of 101. ACA open. It</p> <p>25 says, fine -- fin right. Marked decrease</p>	<p style="text-align: right;">Page 11</p> <p>1 Q. Okay.</p> <p>2 A. Same as TIMI. You know, they're</p> <p>3 analogous.</p> <p>4 Q. And the goal of a bunch of studies</p> <p>5 that we will talk about later today is to</p> <p>6 achieve reperfusion to a two B or three</p> <p>7 level, correct?</p> <p>8 A. Yes.</p> <p>9 Q. Okay.</p> <p>10 A. On an urgent basis.</p> <p>11 Q. Right. Are you finished with the</p> <p>12 CTA interpretation?</p> <p>13 A. Yes.</p> <p>14 Q. Okay. Were you able to actually</p> <p>15 see an acute thrombus or embolus in the M1 or</p> <p>16 M2 branch of the MCA?</p> <p>17 A. No.</p> <p>18 Q. Okay. Where was the occlusion?</p> <p>19 A. I think it's in the mid portion of</p> <p>20 the left M1 segment.</p> <p>21 Q. And when it's in the mid portion,</p> <p>22 is that proximal or distal --</p> <p>23 A. It's in the middle.</p> <p>24 Q. -- or neither?</p> <p>25 A. It's in the middle.</p>
<p style="text-align: right;">Page 10</p> <p>1 left MCA versus -- and then it's blank --</p> <p>2 coronal. Implies left M1 mid TICl, T-I-C-I,</p> <p>3 zero, slash, 41 of 101 with slight flow</p> <p>4 distally.</p> <p>5 Q. Okay. And TICl, the T-I-C-I, is</p> <p>6 the method of measurement of blood flow with</p> <p>7 the ideal being three?</p> <p>8 A. Yeah. It's -- the cardiologists,</p> <p>9 because they deal with the myocardium, call</p> <p>10 theirs TIMI.</p> <p>11 Q. TIMI. But you call it TICl?</p> <p>12 A. And we used to call it TIMI for the</p> <p>13 brain thinking it was just any artery. But,</p> <p>14 recently, if the cardiologists could have M</p> <p>15 for myocardium, we could have C for cerebral.</p> <p>16 So they became TIMI, and we became no longer</p> <p>17 TIMI, but TICl.</p> <p>18 Q. But the point is, under the TICl</p> <p>19 scale --</p> <p>20 A. Same as TIMI.</p> <p>21 Q. -- the ideal is three?</p> <p>22 A. Correct.</p> <p>23 Q. Zero is no flow, three is unimpeded</p> <p>24 flow?</p> <p>25 A. Correct.</p>	<p style="text-align: right;">Page 12</p> <p>1 Q. So it's neither proximal nor</p> <p>2 distal. It's in the middle of M1?</p> <p>3 A. Yes.</p> <p>4 Q. Okay. Were there occlusions</p> <p>5 elsewhere on the CTA?</p> <p>6 A. Not that I saw.</p> <p>7 Q. Could you tell how long the</p> <p>8 occlusion had been present?</p> <p>9 A. No.</p> <p>10 Q. Is that because of this study</p> <p>11 itself, or is that a limitation of the CTA in</p> <p>12 general?</p> <p>13 A. I'm not sure how to answer that.</p> <p>14 Q. Is there something wrong with the</p> <p>15 question?</p> <p>16 A. No, no, no. It's a good question,</p> <p>17 as you always have them. But I -- I'm not</p> <p>18 sure how to -- how to answer how long it had</p> <p>19 been there based upon that scan.</p> <p>20 Q. Okay.</p> <p>21 A. Now, I know a lot more about him</p> <p>22 than just that scan. But just in terms of</p> <p>23 the scan by itself --</p> <p>24 Q. Right.</p> <p>25 A. -- it's -- it shows, you know, a</p>



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1 high grade lesion in the mid left M1 segment  
2 with some flow that gets past it.  
3 Q. How did the flow get past the  
4 obstruction or stenosis?  
5 A. It may be that it's not completely  
6 occluded, although it looks that way with CT.  
7 Q. Okay.  
8 A. The definitive test for that would  
9 not be CTA, but catheter angiography.  
10 Q. Correct.  
11 A. And so the fact that there's flow  
12 distally could be that there's just a little  
13 bit of flow that's very hard to see using CTA  
14 or there is collateral flow from other  
15 sources that provides blood flow beyond or  
16 distal to where the obstruction is.  
17 Q. Well, I wanted to ask you about  
18 that. As you looked at the CTA, did you see  
19 the presence of good collateral flow from the  
20 meningeal arteries to the area also served by  
21 the M1 branch of the MCA?  
22 A. No. The -- the CTA has a very hard  
23 time looking at collateral depending upon the  
24 source in terms of how signal acquisition is  
25 done.

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1 Q. Well, irrespective of the  
2 limitations of the study itself --  
3 A. Right.  
4 Q. -- did you see anything that you  
5 thought to be evidence of good collateral  
6 flow originating with the meningeal arteries  
7 into the same territory served by the M1  
8 branch of the MCA?  
9 A. I did not think from that study  
10 that there was good meningeal collateral  
11 flow.  
12 Q. Okay.  
13 A. There was only distal flow. So  
14 it's getting there somewhere. How it gets  
15 there, I don't know. The adequacy of that,  
16 it's not as bright as the other side.  
17 Q. Could you tell, though, that the  
18 flow distal to the mid point of the M1 branch  
19 was active flow, or was it just stasis, just  
20 blood that's apparent distal to the  
21 obstruction?  
22 A. The way the study is done, it's a  
23 time study.  
24 Q. Right.  
25 A. And so when you see contrast in the

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1 vessels, we presume that it flowed there. It  
2 wasn't that there had been already bright  
3 signal seen because of clot. And we already  
4 knew, as I mentioned earlier from the CT head  
5 scan done that morning, that there was no  
6 evidence of clot in the middle cerebral  
7 artery on the CT head.  
8 Q. Correct. Now, you mentioned two  
9 areas of -- where you identified the presence  
10 of calcification --  
11 A. Yes.  
12 Q. -- on the CT that was done that  
13 morning?  
14 A. Correct.  
15 Q. Where were those two locations  
16 again?  
17 A. They're in the left vertebral  
18 artery and the right internal carotid artery  
19 at the siphon.  
20 Q. And on a traditional CT scan, is  
21 the calcification shown by virtue of its  
22 greater brightness or darkness in relation to  
23 the background?  
24 A. It's bright.  
25 Q. All right. Now, it may require you

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1 to look at another set of notes, but  
2 subsequently you received a copy of an MRI  
3 and an MRA that was performed on December 23,  
4 2015 at University Medical Center in Lebanon,  
5 correct?  
6 A. Yes. But not at the time of these  
7 notes.  
8 Q. Oh, I understand.  
9 A. Yeah.  
10 Q. What I'd like you to do is tell us  
11 what you see -- what you saw when you  
12 reviewed the MRI and the MRA taken 12/23/15,  
13 with particular reference to the left MCA in  
14 Mr. Ruffino's brain.  
15 A. The MRA is easier to discuss. The  
16 MRI scan showed no evidence of acute ischemia  
17 on 12/23/15 on the diffusion weighted  
18 sequences. The inversion recovery sequences  
19 we call flare showed prior ischemia on both  
20 sides of the brain. The gradient sequences  
21 showed no evidence of hemorrhage. The MRA  
22 done the same day as the MRI of the head --  
23 Q. On 12/23/15?  
24 A. Correct. Showed mid M1 signal drop  
25 out on the left with distal flow. And that

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1 was my opinion about the outside imaging.  
2 Q. Okay. What do you mean by M1  
3 signal drop out?  
4 A. Well, the MRA is a very different  
5 bit of technology than CT angiography. A CT  
6 we give dye, and it's a lot of contrast and a  
7 time study. With the MRA it depends upon  
8 flow, but it has to do with how we align  
9 protons and spin. So it's heavily dependent  
10 upon, one, the direction of flow and the  
11 amount of flow.  
12 Q. Okay.  
13 A. So with an MRA, when an artery is  
14 narrowed to 50 percent as opposed to 60  
15 percent or 70 percent or 80 percent, in terms  
16 of the imaging it looks the same because it's  
17 called time of flight imaging. So in this  
18 particular example, it shows he's got a mid  
19 left M1 segment lesion, and there seems to be  
20 flow past it.  
21 Q. Okay.  
22 A. But the degree of narrowing,  
23 whether it's 50, 60, 70, 80, or 90 can't be  
24 determined from that study.  
25 Q. All right. Now, how were you able

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1 to determine the presence of distal flow?  
2 A. Just with the scan.  
3 Q. Okay.  
4 A. You look at that and you see it.  
5 Q. Were you able to determine any  
6 volumetric comparison with what you would  
7 expect to be the norm for a patient of that  
8 age, that body habitus, with his smoking  
9 history, his hypertension, all those things,  
10 were you able to make a comparison from a  
11 volume standpoint of the distal flow versus  
12 what you would expect to see?  
13 A. It's difficult to do that, one.  
14 Two, there seemed to be flow that is most  
15 likely forward given the time of flight  
16 signal acquisition, but the brightness of the  
17 M2 branches seem less than the right side,  
18 the opposite side of the brain.  
19 So I think there was probably  
20 sufficient narrowing that there was stenosis  
21 and some limitation of flow using that  
22 technique. You should take that with a grain  
23 of salt though.  
24 Q. Stenosis means what?  
25 A. Narrowing.

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1 Q. Okay. And with respect to the  
2 magnetic resonance angiogram or MRA of  
3 12/23/15, you cannot tell us to a reasonable  
4 degree of medical certainty the degree of  
5 stenosis in the M1 branch, correct?  
6 A. I can tell you it's more than 50  
7 percent and less than 100. But in between, I  
8 can't tell you.  
9 Q. Now, with respect to the MRI, you  
10 made reference to the presence on the flare  
11 sequencing of prior ischemia bilaterally. I  
12 don't know if you said symmetrically, but  
13 bilaterally I heard?  
14 A. Yes.  
15 Q. Tell us what you were able to see  
16 on the MRI in the flare sequence. Were they  
17 ischemic changes in the white matter alone  
18 symmetrically and bilateral or not?  
19 A. They're rarely symmetric. They're  
20 most commonly -- it's a very common finding.  
21 Typically, they are bilateral. They vary in  
22 size. And I didn't count numbers on right  
23 versus left. I thought the burden of change  
24 was similar.  
25 Q. Secondary to long standing

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1 hypertension?  
2 A. Well, we never know. The  
3 radiologists read it secondary to all kinds  
4 of things. But I thought they were most  
5 likely from some sort of vascular risk factor  
6 in this particular gentleman.  
7 Q. Specific to Ruffino, what do you  
8 think the bilateral arguably symmetric  
9 changes on MRI on 12/23/15 were due to?  
10 A. Yeah. I don't think they're  
11 symmetric. I think they're asymmetric,  
12 number one. I suspect they're due to  
13 smoking, age, inheritance, and  
14 hyperlipidemia.  
15 Q. Okay. What areas of the brain were  
16 affected by the changes consistent with  
17 chronic ischemia?  
18 A. Only the white matter. There was  
19 no evidence of cortical involvement.  
20 Q. And the cortex is the gray matter  
21 that overlies the white?  
22 A. The outside of the brain, right,  
23 where the chip set is.  
24 Q. All right. How long had the  
25 stenosis as shown by the MRA been present?

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1 A. Yeah. The scan wouldn't you let  
2 you know that.  
3 Q. Based on your familiarity with this  
4 form of vascular imaging and this  
5 presentation among smoking Caucasian males in  
6 the southeast, how long do you think it had  
7 been present in this man?  
8 A. For some time.  
9 Q. Years?  
10 A. He probably had had plaque there  
11 for an extended period of time, and that may  
12 be more than years, even decades.  
13 Q. Okay. In your statement that you  
14 signed you make reference to activated  
15 plaque?  
16 A. Yes.  
17 Q. When you use the term "activated,"  
18 what do you mean?  
19 A. That there's been some disruption  
20 of the cover over the plaque and now there's  
21 an interaction with circulating blood so that  
22 there's debris laid on top of it.  
23 Q. All right. Dr. Callahan, do you  
24 have a set of notes of the imaging  
25 interpretation you did on the 12/23/15

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1 studies as well?  
2 A. I have a note I wrote on the  
3 outside of an envelope.  
4 Q. That's good enough.  
5 MR. GIDEON: Let's make that the  
6 next exhibit.  
7 (Whereupon, the above-mentioned  
8 document was marked as Exhibit No. 3 to the  
9 testimony of the witness.)  
10 BY MR. GIDEON:  
11 Q. I want to make sure we have a  
12 comprehensive oral inventory of what you have  
13 and what you received. You will recall that  
14 we delivered a subpoena to your office asking  
15 you to have all those materials here today.  
16 It is sufficient if you will just  
17 tell us what you have and when you received  
18 it. Go ahead. Start with the beginning.  
19 What did you get at the outset and what did  
20 you get subsequently?  
21 A. Well, at the outset I had a phone  
22 call. And subsequent to the phone call I  
23 sent a bill, which is how I knew I'd been  
24 contacted in August of 2017.  
25 Q. Do you have notes, then, of the

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1 phone call --  
2 A. No.  
3 Q. -- in August of 2017?  
4 A. No. If I had, I'd have brought  
5 them.  
6 Q. How long was the phone call itself  
7 as reflected by your invoice?  
8 A. I only know that I spent roughly an  
9 hour, but that wasn't the phone call. There  
10 must have been something else that might have  
11 been provided me.  
12 Q. All right. Well, what's the  
13 invoice say? Does it say phone call plus  
14 review of some material?  
15 A. Review of provided materials and  
16 phone call three-fourths of an hour.  
17 Q. Okay. Provided materials. Do you  
18 have a memory of what those were?  
19 A. No. It was my recollection that  
20 the matter had been dispensed with in August  
21 of 2017, so...  
22 Q. In what way?  
23 A. Well, I'd given my opinion and most  
24 often that's that.  
25 Q. How could you give your opinion

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1 about a case without having received any  
2 materials?  
3 A. Oh, I did have materials. That's  
4 when I sent the invoice on the 22nd. So I  
5 had to get something.  
6 Q. We don't know what you got though.  
7 A. And I don't recall either.  
8 Q. And there are no notes reflecting  
9 your review of the materials?  
10 A. No. No. Notes are less common  
11 during the month of August.  
12 Q. Because you're usually in the  
13 northeast?  
14 A. Because I was with my  
15 grandchildren.  
16 Q. All right. Then you have this  
17 letter that's at the end of the year 2017  
18 that we've already exhibited?  
19 A. Correct. So the letter, as I  
20 mentioned, came with discs, two discs of  
21 imaging. So those are the two discs that  
22 came with the letter. And there's the backup  
23 set of discs.  
24 After that, in review there were  
25 letters that I sent of invoices to

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1 Mr. Cummings. And then I received a  
2 supplemental disclosure of the plaintiff's  
3 Rule 26 and affidavit, my affidavit. And I  
4 prepared a statement and a report. And then  
5 I have some backup copies.  
6 Q. That's it?  
7 A. I have a list of cases. There's  
8 supposed to be a CV. And that's it, I think.  
9 Q. What do you have on your computer  
10 that you haven't printed out? For example,  
11 did you get a copy of the deposition of Clark  
12 Archer, the ER physician?  
13 A. No. I haven't seen that.  
14 Q. Okay. Did you at any time get a  
15 copy of the depositions of any of the nurses?  
16 A. Yes. I received an electronic copy  
17 of that.  
18 Q. Which nurses' depositions did you  
19 see electronically?  
20 A. Well, I also got Archer  
21 electronically, sorry. I received  
22 electronically Archer, Ruffino, Mrs. Ruffino,  
23 Carol McCulloch and Bromley.  
24 Q. Any others?  
25 A. I'm looking. I think that's -- I

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1 think that's it.  
2 Q. When did you receive the deposition  
3 transcripts electronically?  
4 A. I don't know.  
5 Q. Can we tell from the invoicing that  
6 you received them before a certain date as  
7 reflected by the bill?  
8 A. The invoice I sent was on my birth  
9 date, December 13th of '17. It only talks  
10 about review of provided materials. But  
11 given the length of time, that must have been  
12 the depositions. There was a phone call and,  
13 also, I reviewed an affidavit.  
14 Q. Your affidavit or somebody else's?  
15 A. It just says "affidavit." I  
16 suspect that -- well, all I know is what it  
17 says.  
18 Q. All right. Now, with the exception  
19 of the electronic copies of the depositions  
20 you've just mentioned, have you seen  
21 electronic versions of any other items?  
22 You'll recall I mentioned a Jodi Dodds,  
23 vascular neurologist at Duke, and you said  
24 you had some recollection of seeing something  
25 with her name on it. You didn't recall

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1 Dr. Zazulia at Washington University in  
2 St. Louis.  
3 Do you recall seeing disclosures,  
4 affidavits, anything else from any other  
5 healthcare providers?  
6 A. It may be crosstalk, but I thought  
7 I'd seen something from Duke electronically,  
8 but it may be a different case.  
9 Q. There is a neurologist in Lebanon  
10 whose name is Deka Efobi that this individual  
11 saw on a referral from a Dr. Luck, family  
12 practitioner. Have you seen Dr. Efobi's  
13 office notes?  
14 A. I saw a letter that he sent to  
15 Dr. Luck in a recent email of Dr. Luck's  
16 notes.  
17 Q. But you have not seen Efobi's  
18 office notes?  
19 A. Only the copy that he sent to  
20 Dr. Luck with initial --  
21 Q. For --  
22 A. -- with the initial -- his initial  
23 consult.  
24 Q. Okay. Did you ever see the  
25 homocysteine levels for the lab tests ordered

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1 by Dr. Efobi?  
2 A. No.  
3 Q. Have you seen the entire Centennial  
4 chart?  
5 A. Yes.  
6 Q. Now, you know this patient was  
7 transferred on the 17th from StoneCrest to  
8 Centennial, remained in the hospital until  
9 the 26th of February, and went home. Have  
10 you seen that entire chart?  
11 A. Yes.  
12 Q. Okay. All right. Before we came  
13 here to take your deposition today, who have  
14 you met with with regard to the case against  
15 StoneCrest and when did those meetings occur?  
16 A. I met with Mr. Cummings.  
17 Q. When?  
18 A. He came last week on Thursday. And  
19 he may have come once before, but my bills  
20 don't reflect that.  
21 Q. Okay. Have you already issued a  
22 bill for the meeting last week on Thursday?  
23 A. No.  
24 Q. How long was the meeting?  
25 A. Ninety minutes.



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1 Q. And what was the subject matter of  
2 the meeting?  
3 A. The deposition today.  
4 Q. Are you familiar with the name of a  
5 physician named Trey Pope?  
6 A. Pope?  
7 Q. Trey Pope, P-O-P-E?  
8 A. No.  
9 Q. Are you familiar with the name of a  
10 physician named Rajat Dhar, D-H-A-R?  
11 A. Yes.  
12 Q. How so?  
13 A. I'd heard about him in a phone call  
14 last night. And I think I had read something  
15 that he may have written in this case,  
16 although I may have read him in a different  
17 case.  
18 Q. Well, did you have a phone call  
19 with Dr. Dhar last night or with someone  
20 else?  
21 A. No, I'm sorry. Mr. Cummings called  
22 me last night.  
23 Q. Okay. How long was that phone call  
24 last night?  
25 A. Half an hour.

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1 Q. Did he tell you I'd taken the  
2 deposition of Dr. Dhar yesterday in  
3 St. Louis?  
4 A. Yes, sir.  
5 Q. What did he tell you about the  
6 deposition?  
7 A. That it was complete and thorough.  
8 Q. Well, what did he say about the  
9 substance as compared to the form?  
10 Substantive testimony by Dhar?  
11 A. Yeah. He reviewed with me  
12 Dr. Dhar's opinion that because of the  
13 location of the changes in imaging, that IV  
14 tPA peripheral thrombolysis might have been  
15 especially helpful. That was sort of the  
16 main takeaway thing about it.  
17 Q. Did he review with you that  
18 Dr. Dhar is not a stroke neurologist?  
19 A. He -- yes. He told me that at Wash  
20 U they have a bifurcated program of care. So  
21 they have a stroke team that lives in the ED,  
22 and then they have an ICU team that takes  
23 over after whatever happens in the ED. And  
24 that Dhar is not in the ED group, he's in the  
25 intensivist group.

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1 Q. Right. But by his own admission,  
2 did Mr. Cummings tell you Dr. Dhar said he's  
3 not a part of the stroke division of the  
4 department of neurology at Washington  
5 University?  
6 A. I don't know their arrangement. It  
7 was my understanding that he's not part of  
8 the ED team. He's part of the intensivist  
9 care team.  
10 Q. Did Mr. Cummings tell you that  
11 Dr. Dhar was insisting yesterday that the  
12 occlusion in M1 was very proximal --  
13 MR. CUMMINGS: Object to the form.  
14 BY MR. GIDEON:  
15 Q. -- and not distal at all?  
16 A. I don't remember that. I don't  
17 think I asked him if he knew precisely where  
18 it was. But it was my understanding that he  
19 thought it was distal, and so there wasn't  
20 much clot in it. And, therefore, IV tPA  
21 would have been better than I thought.  
22 Q. Yeah. Well, you have spent some  
23 time in your career addressing the issue of  
24 efficacy of IV tPA alone, haven't you?  
25 A. Well, my work was more catheter

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1 directed as opposed to the intervenous form.  
2 Q. Well, back in the days when you and  
3 Brian Berger were doing intra-arterial  
4 thrombolysis of clots, you were threading a  
5 catheter up to a point close to the thrombosed  
6 and then lysing it in that fashion with  
7 intra-arterial thrombolytic substances,  
8 correct?  
9 A. Yes, that's very close. In 1994 we  
10 started doing that at Parkview Hospital.  
11 Q. Right. But in the years since  
12 then, you have paid attention to efficacy of  
13 intravenous thrombolytics, haven't you?  
14 A. Yes, with what I've read.  
15 Q. Right. And you testified about  
16 efficacy of intervenous thrombolytics in the  
17 Featherston v. Mercy Health Partners case,  
18 correct?  
19 A. I don't remember the names. But  
20 I've had an ample opportunity to discuss the  
21 benefit that it provides.  
22 Q. Yeah. Featherston is the case  
23 involving Lourdes Hospital in Paducah,  
24 Kentucky. Do you not recall that now?  
25 A. No.



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1 Q. Okay. And do you recall testifying  
2 in Ferrion (phonetic) v. Martin Memorial  
3 Hospital, the hospital in Martin, Florida?  
4 Surely, you remember the name Ferrion?  
5 A. No, that's harder. Is this a  
6 recent case from Florida with Sean Domnick?  
7 Q. Yes.  
8 A. I remember that case.  
9 Q. Okay. Do you recall testifying in  
10 Featherston that intravenous tPA would be,  
11 quote, like whistling at the incoming tide,  
12 too much clot to lyse, end quote, in that  
13 case?  
14 A. Sounds like something I would say.  
15 Q. All right.  
16 A. Normally, I use a little science  
17 with it, too, rather than colloquial  
18 commentary.  
19 Q. Do you recall in Featherston  
20 testifying that tPA would have been of no  
21 benefit in that case because tPA is only good  
22 for about a 30 percent benefit? Do you  
23 recall that?  
24 A. That is -- if I said that, I'm  
25 correct because that's what the science says.

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1 Q. Okay. Do you recall testifying in  
2 Ferrion same thing, that with tPA you're  
3 wasting your time because it only has a 30  
4 percent benefit?  
5 A. It only has a 30 percent benefit,  
6 that statement is accurate.  
7 Q. Okay. Thirty percent meaning what,  
8 out of 30 out of 100 will benefit from  
9 intravenous tPA alone?  
10 A. Correct. Assuming that you  
11 establish their candidacy like the NINDS  
12 trial publication. That's where the 30  
13 percent came from.  
14 Q. Right. NINDS is N-I-N-D-S, 1995  
15 publication in the New England Journal of  
16 Medicine, isn't it?  
17 A. Correct. December 14th, 1995.  
18 Q. Right. And isn't that the  
19 publication that the FDA relied upon to  
20 permit the use of intravenous tPA for up to  
21 three hours after the patient was last known  
22 normal?  
23 A. That publication, that trial was  
24 the basis for which the new drug approval was  
25 granted for intravenous thrombolysis for

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1 acute ischemic stroke in North America by the  
2 FDA in June of 2016.  
3 Q. Correct. And that was they  
4 permitted labelling for use up to three  
5 hours, correct?  
6 A. That is correct.  
7 Q. Now, there has been a subsequent  
8 effort to expand the permitted labelling to  
9 authorize the manufacturer to promote the  
10 drug as being used for between 3 and 4.5  
11 hours, correct?  
12 A. No.  
13 Q. No. There hasn't been an effort to  
14 convince the FDA to permit them to change the  
15 labelling?  
16 A. Not that I'm aware of. Our  
17 guidelines talk about the use of the extended  
18 time window, but make the point that it's an  
19 off label use of the drug.  
20 Q. All right. So let's just be clear  
21 for the purposes of the record itself. Back  
22 in February of 2016 when Mr. Ruffino was at  
23 StoneCrest, the FDA approved labelling  
24 allowed the use of intravenous tPA for up to  
25 three hours after last known normal, correct?

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1 A. Yes. Assuming other issues of  
2 candidacy are met.  
3 Q. Correct. The off label use, that  
4 is -- has been advocated by some and  
5 recommended by others, is between 3 and up to  
6 4.5 hours, assuming other criteria are met as  
7 well, correct?  
8 A. That is correct. It's been part of  
9 our guidelines for a long time.  
10 Q. Right.  
11 A. It's not part of the FDA approved  
12 use of Alteplase.  
13 Q. Now, what other articles establish  
14 that intravenous tPA only provides benefit to  
15 30 out of 100 if the patient otherwise fits  
16 the selection criteria for use of the drug?  
17 A. It's only the NINDS trial.  
18 Q. Okay. I have heard other  
19 physicians refer to the NINDS trial as one  
20 where it took -- you had to treat three to  
21 benefit one. Is that accurate?  
22 A. It's a little bit worse than that,  
23 but anyway.  
24 Q. Okay. Is it your opinion in this  
25 case then, that the probability is that if

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1 Mr. Ruffino had been given intravenous tPA  
2 alone, his probable benefit would have been  
3 30 percent?  
4 A. Yes.  
5 Q. Thirty percent is less than 50  
6 percent, isn't it?  
7 A. Yes.  
8 Q. Okay. In order for Mr. Ruffino to  
9 benefit in this case, he would have required  
10 intravenous tPA plus endovascular  
11 intervention?  
12 A. Yes. Or he could have had  
13 endovascular intervention without IV tPA to  
14 receive what I believe would be the same  
15 benefit. The benefit between IV tPA as we've  
16 been discussing and the benefit with  
17 endovascular therapy are different benefits.  
18 They're not the same.  
19 Q. Correct.  
20 A. Okay.  
21 Q. Correct. But in terms of  
22 addressing the big picture of improvement to  
23 a more probably true than not standpoint,  
24 more than 50 percent, Mr. Ruffino would have  
25 required intravenous tPA plus endovascular

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1 intervention or endovascular intervention  
2 alone?  
3 A. Correct.  
4 Q. Okay. I was surprised when I read  
5 the Ferrion deposition. I didn't recall that  
6 you were an attending at the city hospital.  
7 Are you still doing that?  
8 A. I was there yesterday in the ED  
9 yesterday.  
10 Q. I want to talk to you for a few  
11 moments about your staff privileges. You  
12 have staff privileges at Saint Thomas  
13 currently, don't you?  
14 A. Yes.  
15 Q. In the department of neurology?  
16 A. I think it's medicine. There's no  
17 separate neuro department.  
18 Q. How long have you had staff  
19 privileges at Saint T?  
20 A. Since 1981.  
21 Q. Okay. You do not have staff  
22 privileges any longer at Centennial, do you?  
23 A. No, I do.  
24 Q. You do? Are you sure?  
25 A. Well, I think I do. I get emails

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1 from them every day about getting patients  
2 out of the hospital and paid my dues last  
3 year. So if you know better than I, then  
4 thanks for letting me know to get a refund.  
5 They owe me 250 bucks.  
6 Q. Dr. Callahan, have you performed an  
7 endovascular procedure at Saint Thomas  
8 hospital?  
9 A. No.  
10 Q. Have you performed an endovascular  
11 procedure at Centennial Medical Center since  
12 you and Brian Berger stopped doing the  
13 intra-arterial thrombolytic?  
14 A. No.  
15 Q. When did that stop?  
16 A. About 2001. 1994 through 2001.  
17 And we did over 400 cases.  
18 Q. Right. Well, I particularly  
19 remember the -- it's either a flight  
20 attendant or a pilot with such a dramatic  
21 improvement.  
22 A. Yeah.  
23 Q. Do you remember the one I'm talking  
24 about?  
25 A. Yeah. That one made the Discovery

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1 Channel. That was so big.  
2 Q. Yeah.  
3 A. But that was neither Berger nor  
4 myself. Those were people that we had  
5 trained during the month of August when I was  
6 away.  
7 Q. So you can't take credit for that?  
8 A. Only vicariously.  
9 Q. You haven't done any endovascular  
10 procedures at Centennial since 2001, correct?  
11 A. No, have not.  
12 Q. What about at -- I think it's still  
13 called General Hospital, isn't it?  
14 A. Yeah, Metro General --  
15 Q. Yeah --  
16 A. -- is what they call it.  
17 Q. Have you done any endovascular  
18 procedures at Metro General?  
19 A. No.  
20 Q. When's the last time you ordered  
21 intravenous tPA for anybody?  
22 A. Earlier this year at Metro General.  
23 Q. Sometime in 2018?  
24 A. Sure.  
25 Q. Let's just take the last two years.



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1 How many times have you ordered intravenous  
2 tPA?  
3 A. Probably two or three.  
4 Q. And how many patients have you seen  
5 in the last two years in an, you know, acute  
6 care setting, an institutional setting?  
7 A. I don't know the answer to that.  
8 Q. Hundreds?  
9 A. No. No. Because it's -- my work  
10 at the city hospital is just four days a  
11 month. And then it's not every month of the  
12 year. It's 11 months most years.  
13 Q. Would you agree that someone who  
14 claims expertise in the area of stroke should  
15 know that the outcomes utilizing intravenous  
16 tPA alone never reach 50 percent or greater?  
17 Don't you think somebody should know that?  
18 A. I'd have to disagree with your --  
19 with your question, but it's a very complex  
20 disagreement.  
21 Q. Well, for example --  
22 A. And the reason is that even my  
23 friends that know tPA is only worth 30  
24 percent have still testified that there would  
25 have been benefit because of post hoc

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1 analysis of the NINDS data. They even  
2 published that. And I consider these men  
3 thoughtful in their academic, you know,  
4 bright lights and so forth. But they -- and  
5 I understand the reason for why they say what  
6 they do.  
7 So it's a little more nuanced in  
8 the way that you ask it. I know it's only  
9 good for 30 percent based upon the study, the  
10 heart science.  
11 Q. Right.  
12 A. And then those who were delighted  
13 with the result, but disappointed with what  
14 happened by treating physicians in America  
15 over the next decade and a half recut the  
16 data to show that there was post hoc benefit,  
17 depending on changing the definition of  
18 benefit.  
19 And I felt that I know why they  
20 wanted to say that. I shared their concern,  
21 but I lack their enthusiasm for data dredging  
22 and torturing the prior data. I thought the  
23 IV tPA data was the data.  
24 And then if you want to have  
25 another conclusion, you have to say it's post

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1 hoc. We've done data dredging. We've done  
2 all this statistical thing with propensity  
3 matching, but you have to be very clear  
4 channeled that you're doing it with a purpose  
5 rather than having done a scientific study to  
6 answer a question.  
7 Q. Well, then let's distill this. The  
8 science tells us benefit, 30 percent?  
9 A. Correct.  
10 Q. If a lawyer can read the  
11 publications on the ESCAPE trial, the SWIFT  
12 PRIME trial, and the EXTEND-1A trial, then a  
13 physician ought to be able to do the same,  
14 correct?  
15 A. Yes.  
16 Q. Okay. The ESCAPE, SWIFT PRIME, and  
17 EXTEND-1A trials all demonstrate benefit of  
18 intravenous tPA alone at less than 50  
19 percent, don't they?  
20 A. That is correct.  
21 Q. Okay. Have you examined  
22 Mr. Ruffino?  
23 A. No.  
24 Q. Do you think any benefit would be  
25 served at all by you examining him?

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1 A. Not for him.  
2 Q. Do you consider your undertaking in  
3 this case to determine his degree of function  
4 or dysfunction? Have you been asked to do  
5 that?  
6 A. No, I haven't.  
7 Q. So you're not going to be in a  
8 position to say that he's got this degree of  
9 permanent impairment or that degree of  
10 disability without -- well, based on the  
11 information you have, are you?  
12 A. It would require more data.  
13 Q. And an examination, wouldn't it?  
14 A. By someone.  
15 Q. How about you? Before you could  
16 offer an opinion that he has some degree of  
17 impairment or disability, that he is  
18 permanently limited, wouldn't you have to  
19 examine him?  
20 A. No. Someone -- one of my  
21 colleagues could examine him and render an  
22 opinion that, if I read it, I would be  
23 satisfied with what they said.  
24 Q. Well, have any of your colleagues  
25 examined him, rendered an opinion, and sent



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1 the materials to you for the purposes of you  
2 forming an opinion about his degree of  
3 impairment or disability?  
4 A. No.  
5 Q. Have you spoken with Ruffino?  
6 A. No.  
7 Q. Have you requested the opportunity  
8 to do so?  
9 A. No.  
10 Q. Have you ever even seen him?  
11 A. Yes.  
12 Q. Did you see him on the dash cam  
13 video?  
14 A. Yes. And I listened to Glenn Beck  
15 at the same time.  
16 Q. Yeah. From the police radio?  
17 A. Yes.  
18 Q. I want to ask you about one  
19 particular area that I think you're probably  
20 interested in and up to speed on. I'll hand  
21 it to you.  
22 Dr. Callahan, have you seen this  
23 article entitled "Acute cigarette smoke  
24 exposure reduces clot lysis - association  
25 between altered fibrin architecture and the

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1 response to tPA"? Have you seen that  
2 previously?  
3 A. No.  
4 Q. Are you aware of any scientific  
5 interest in that subject?  
6 A. Not until you handed this to me.  
7 MR. GIDEON: I'll make a copy of  
8 this the next exhibit.  
9 (Whereupon, the above-mentioned  
10 document was marked as Exhibit No. 4 to the  
11 testimony of the witness.)  
12 BY MR. GIDEON:  
13 Q. Is the publication "Thrombosis  
14 Research" generally regarded as reliable and  
15 authoritative?  
16 A. You know, I don't get this journal,  
17 and I don't know their impact value.  
18 Q. Based on your past expertise and  
19 current interest in the field, do you agree  
20 that acute cigarette smoke exposure in  
21 smokers results in changes in fibrin  
22 architecture and the clots associated with  
23 those architectural changes are more  
24 resistant to lysis with tPA than others  
25 untreated by cigarette smoke exposure?

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1 A. Do you want me to read the article  
2 so I can respond if that's what they showed?  
3 Q. That's what they --  
4 A. And I'm satisfied with how they  
5 conducted --  
6 Q. That's what they can conclude. I  
7 don't want to spend the time to have you read  
8 the whole article and vet it. I just wanted  
9 you to know whether you agreed with that  
10 conclusion or if you have no opinion on that  
11 point?  
12 A. At present, I can read what they've  
13 written, but have no opinion on that point.  
14 Q. Okay. What are the fees today?  
15 Still \$500 an hour?  
16 A. Yes.  
17 Q. What's the charge for medical  
18 record review?  
19 A. \$500 an hour.  
20 Q. Everything is \$500 an hour?  
21 A. Yes.  
22 Q. Is that same thing true if you  
23 testify in person?  
24 A. Yes.  
25 Q. What do you make on an annual basis

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1 in terms of testifying? Let's take the year  
2 that I'm sure you just completed, and I hope  
3 you have a memory of your Schedule C. What  
4 did you report as additional income from  
5 medical-legal work for 2017?  
6 A. So I didn't -- I didn't tabulate  
7 those. It's done by an accountant. I get  
8 little bitty things in the mail. They may be  
9 called 1099s or --  
10 Q. You get 1099s in the mail?  
11 A. -- that may not be the right  
12 number.  
13 Q. Many of them from different lawyers  
14 and law firms?  
15 A. Right. There must have been 20 --  
16 at least 20 envelopes that I opened. But  
17 then my accountant actually adds those up and  
18 does whatever they do with them.  
19 Q. Well, remember what I said earlier,  
20 if you don't know the answer or you don't  
21 understand my question, don't answer it.  
22 Do you know what the aggregate  
23 number was for 2017 --  
24 A. No.  
25 Q. -- for your medical-legal work?

<p style="text-align: right;">Page 49</p> <p>1 A. No.</p> <p>2 Q. Can you ballpark it for me? More</p> <p>3 than X and less than Y?</p> <p>4 A. No. I'm -- no.</p> <p>5 Q. Is there any year in the last three</p> <p>6 where you could identify that number for us?</p> <p>7 A. I've always used the same approach.</p> <p>8 The envelopes come. They open them up. They</p> <p>9 add them up, and now, recently, they</p> <p>10 electronically submit.</p> <p>11 Q. Okay. Now, you have never worked</p> <p>12 as a registered nurse in any state, have you?</p> <p>13 A. No.</p> <p>14 Q. And you've never worked as an ER</p> <p>15 physician in any setting, have you?</p> <p>16 A. Correct.</p> <p>17 Q. You are not expressing a standard</p> <p>18 of care opinion on the emergency room nursing</p> <p>19 staff, correct?</p> <p>20 A. Correct.</p> <p>21 Q. And you're not expressing a</p> <p>22 standard of care opinion on the physician</p> <p>23 extender, Mr. Rhinehart?</p> <p>24 A. Correct.</p> <p>25 Q. Or the ER physician Dr. Clark</p>	<p style="text-align: right;">Page 51</p> <p>1 Q. Well, I would like to direct your</p> <p>2 attention to just a couple of points on these</p> <p>3 standards. If you will turn to page 3029.</p> <p>4 A. I'm there.</p> <p>5 Q. And this is the area I'm looking at</p> <p>6 (indicating).</p> <p>7 A. I've got it.</p> <p>8 Q. It makes the statement that is</p> <p>9 consistent with what you just said, and that</p> <p>10 is: However, because recannulization occurs</p> <p>11 in only a minority of patients with large</p> <p>12 vessel occlusion receiving intravenous tPA</p> <p>13 alone, then it quotes 37.3 percent in the</p> <p>14 ESCAPE trial. It then goes on to talk about</p> <p>15 these efforts to do endovascular</p> <p>16 interventional care. You've seen that</p> <p>17 previously, correct?</p> <p>18 A. Yes.</p> <p>19 Q. Do you agree with that statement</p> <p>20 from this publication?</p> <p>21 A. Yes.</p> <p>22 Q. All right. Now, this particular</p> <p>23 publication, which was released in 2015 as an</p> <p>24 update of the 2013 guidelines, includes a</p> <p>25 series of recommendations that then appear on</p>
<p style="text-align: right;">Page 50</p> <p>1 Archer?</p> <p>2 A. Correct.</p> <p>3 Q. Do you know Dr. William Powers</p> <p>4 personally?</p> <p>5 A. No.</p> <p>6 Q. You know who he is, though, don't</p> <p>7 you? He's chief of vascular neurology at the</p> <p>8 University of North Carolina?</p> <p>9 A. I don't -- I don't know him.</p> <p>10 Q. You are familiar with this AHA/ASA</p> <p>11 guideline, aren't you?</p> <p>12 A. Yes.</p> <p>13 Q. Dr. Callahan, are you a member of</p> <p>14 the American Heart Association, American</p> <p>15 Stroke Association?</p> <p>16 A. Yes.</p> <p>17 Q. Is it one organization with two</p> <p>18 names AHA/ASA?</p> <p>19 A. That's a good question. ASA used</p> <p>20 to be separate from AHA.</p> <p>21 Q. Correct.</p> <p>22 A. But I think they're probably under</p> <p>23 the same umbrella. I don't --</p> <p>24 Q. Okay.</p> <p>25 A. I'm not really sure.</p>	<p style="text-align: right;">Page 52</p> <p>1 page 3031. Will you turn to those, please.</p> <p>2 Are you there?</p> <p>3 A. I am.</p> <p>4 Q. Do you agree with me that after</p> <p>5 release of these recommendations, the AHA/ASA</p> <p>6 standards for endovascular treatment</p> <p>7 established criteria that should be met</p> <p>8 before a patient was considered for</p> <p>9 endovascular intervention, and one of those</p> <p>10 requirements was an NIHSS or NIH stroke scale</p> <p>11 of 6 or greater, correct?</p> <p>12 MR. CUMMINGS: Object to the form.</p> <p>13 BY MR. GIDEON:</p> <p>14 Q. Do you see the subsection E?</p> <p>15 A. Yeah. So, now, these are</p> <p>16 guidelines. They're not considered</p> <p>17 standards. I know standards probably has a</p> <p>18 particular meaning on the legal side, but for</p> <p>19 us they're guidelines.</p> <p>20 Q. Right.</p> <p>21 A. And as part of what's gone before</p> <p>22 with their meta-analysis of these trials,</p> <p>23 even though not all the studies required</p> <p>24 that, an NIH stroke scale score greater than</p> <p>25 6 is included into E.</p>

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1 Q. Well, tell me why, to the extent  
2 you know, that when the AHA/ASA published its  
3 focused update of the 2013 guidelines for the  
4 early management of patients with acute  
5 ischemic stroke regarding endovascular  
6 treatment, one of the recommendations before  
7 you would consider endovascular intervention  
8 was, quote, NIHSS score of greater than or  
9 equal to 6. Why was that selected?  
10 A. I don't know.  
11 Q. Okay. One of the other  
12 requirements is an ASPECTS -- excuse me. One  
13 of the other guidelines is an ASPECTS score  
14 greater than or equal to 6, correct?  
15 A. Yes. In answer to your prior  
16 question on page 3029.  
17 Q. Yes?  
18 A. They have a whole paragraph of how  
19 they came by that.  
20 Q. Right.  
21 A. So I don't know independently, but  
22 they write about how they picked out six.  
23 Q. Okay. Did you participate in any  
24 way in the AHA/ASA series of new  
25 recommendations in 2015?

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1 A. No.  
2 Q. These guidelines remained in effect  
3 through the period of time that Mr. Ruffino  
4 was a patient at StoneCrest and Centennial,  
5 correct?  
6 A. Yes.  
7 Q. Okay. They have been recently  
8 updated again in the spring of 2018, haven't  
9 they?  
10 A. They have.  
11 Q. But the recent updates had no  
12 application when Mr. Ruffino was a patient at  
13 StoneCrest?  
14 A. That's correct. There's very  
15 little change in the part of the guidelines  
16 that had to do with that particular aspect of  
17 stroke care though. They're very similar.  
18 Q. Have you based any of your opinions  
19 in this case on specific published  
20 guidelines?  
21 A. No. I talked about the  
22 publications rather than the guidelines in my  
23 affidavit.  
24 Q. Right. And the three studies that  
25 you referred to as I recall in your affidavit

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1 were the ESCAPE, the SWIFT PRIME, and the  
2 EXTEND-1A trials?  
3 A. Right. EXTEND-1A.  
4 Q. EXTEND-1A. Okay. Those are the  
5 three trials you referred to, correct?  
6 A. Yes.  
7 Q. Did you actually participate in any  
8 of those three trials?  
9 A. I did not.  
10 Q. All right. You agree that one of  
11 your responsibilities as a witness offering  
12 opinions in this case is to offer only  
13 scientifically valid opinions, correct?  
14 A. Yes.  
15 Q. You also agree that you should not  
16 be an advocate for or against either party?  
17 A. Yes.  
18 Q. Your job in this case is to offer  
19 responsible scientifically valid opinion  
20 testimony?  
21 A. Yes, sir.  
22 Q. Now, can you calculate the ASPECTS  
23 score on the CTA or the CT that were obtained  
24 on February 17, 2016?  
25 A. At StoneCrest?

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1 Q. Yes. Let's start off a little  
2 simpler. Did you do that when you looked at  
3 those two studies?  
4 A. Yes.  
5 Q. Okay. The Alberta Stroke Program  
6 Early CT Score is what ASPECTS stands for,  
7 correct?  
8 A. Right. Canada.  
9 Q. And it's focused specifically on  
10 changes in the middle cerebral artery  
11 distribution, correct?  
12 A. Right.  
13 Q. All right. When you did the  
14 evaluation of the CT in the morning and the  
15 CTA on the afternoon of February 17, 2016,  
16 what ASPECTS, A-S-P-E-C-T-S, score did you  
17 assign to either or both of those studies?  
18 A. It's done normally by radiology.  
19 They actually have an algorithm that provides  
20 the areas of interest. My review of the  
21 record did not -- I didn't see that they had  
22 rendered an ASPECTS score. I thought the  
23 score would have been ten on both exams.  
24 Q. Why, Dr. Callahan?  
25 A. Because I couldn't see tissue



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1 change that represented acute infarction.  
2 Q. All right. In your opinion, does  
3 it take six hours for the changes associated  
4 with a stroke to appear on a CT scan?  
5 A. That's the number we normally give.  
6 Q. Is that the number you feel  
7 comfortable with?  
8 A. That's kind of a ballpark number  
9 that we use.  
10 Q. Well, you were asked in the Ferrion  
11 case to give an opinion to a reasonable  
12 degree of medical certainty about how long it  
13 would take before a stroke would appear on a  
14 CT scan, and after some discussion, you said  
15 six hours. Are you still comfortable with  
16 that?  
17 A. Oh, yeah. I'm not the only one  
18 comfortable with that. It's a fairly common  
19 number.  
20 Q. Okay. Well, let's talk about this  
21 particular individual and when he was last  
22 normal. What have you looked at as you've  
23 tried to determine what was going on with  
24 Mr. Ruffino from the night of the 16th into  
25 the morning of the 17th in February of 2016?

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1 What data sources have you had?  
2 A. Well, for that part of time only  
3 the deposition testimony.  
4 Q. All right. Now, did you compare  
5 his deposition with his wife's?  
6 A. No. I just read them.  
7 Q. Well, did you notice that, to put  
8 it charitably, Mr. Ruffino is frequently  
9 inaccurate, if not dishonest?  
10 A. I'm not sure about his honesty or  
11 accuracy.  
12 Q. Well, you will recall, for example,  
13 when I began asking his wife questions she  
14 pointed out that her husband had testified  
15 incorrectly, to put it charitably, in a  
16 number of ways. Did you see that?  
17 A. I recall that part of the  
18 deposition.  
19 Q. All right. So how much credence  
20 can you give to Mr. Ruffino's deposition  
21 testimony, then, given that, in terms of  
22 deciding what actually happened on the  
23 morning of the 17th of February?  
24 MR. CUMMINGS: Object to the form.  
25 THE WITNESS: Yeah. I think it's

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1 just a data point. It would be very  
2 difficult for me in the 18th of April 2018 to  
3 establish voracity. We rarely require that  
4 in terms of our medical care because it's  
5 hard to know the truth.  
6 BY MR. GIDEON:  
7 Q. Okay. Well, for example, in this  
8 case you have depositions that you normally  
9 don't have when you're treating a patient.  
10 As a simple example, I asked Mr. Ruffino if  
11 the neurologist, Dr. Efobi, had ever told him  
12 to quit smoking and he said no. Dr. Efobi's  
13 notes document that he was instructed to quit  
14 smoking aggressively twice. Did you see  
15 that?  
16 A. The only copy of the neurologist  
17 notes that I have are the letter that he sent  
18 to Dr. Luck. And they have an item in their  
19 electronic medical record that you have to  
20 populate with responses, and it said to quit  
21 smoking.  
22 Q. Right.  
23 A. Whether that means that he spent an  
24 extended period of time counselling a very  
25 heavy smoker that he needed to quit, I don't

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1 know. The chart reflects that he indicated  
2 in the check box that he told him to quit  
3 smoking.  
4 Q. Right. Likewise, in his deposition  
5 Mr. Ruffino denied that he'd ever had  
6 difficulty speaking with any prior event.  
7 You saw that wasn't true, didn't you?  
8 A. Well, he had told Dr. Luck  
9 different things, but anyway.  
10 Q. Well, what I'm trying to get at --  
11 A. There are differences in what  
12 patients tell us. And I've always understood  
13 that was just how they communicated with me.  
14 Q. Well, he also testified under oath  
15 that he first had difficulty with mini  
16 strokes beginning in December of 2015.  
17 Here's a copy of Dr. Luck's record. I don't  
18 know if you've seen it or not.  
19 A. No, I have. Because it started in  
20 November according to Dr. Luck, and there had  
21 been six episodes.  
22 Q. Okay. In fact, Dr. Luck's note  
23 says that he was having, he being  
24 Mr. Ruffino, the man who denied under oath  
25 ever having difficulty speaking with any



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1 episode, who insisted he'd never had any  
2 symptoms in his right leg under oath, and had  
3 insisted under oath his first trouble was in  
4 December of 2015, on November 24, 2015 he  
5 told Dr. Luck that he had problems right side  
6 of face, can't talk, upper extremity right  
7 arm, lower extremity right leg to foot, and  
8 also that the onset began a month ago, which  
9 would take it into October of 2015. You've  
10 got that in front of you right now, correct?  
11 A. Yes. Yeah, I've seen this.  
12 Q. Okay. Well, given just the little  
13 bit of time we've spent on this, wouldn't you  
14 agree with me that Mr. Ruffino is -- give  
15 that to her. We'll make that an exhibit.  
16 MR. GIDEON: We'll make Dr. Luck's  
17 note the next exhibit.  
18 (Whereupon, the above-mentioned  
19 document was marked as Exhibit No. 5 to the  
20 testimony of the witness.)  
21 BY MR. GIDEON:  
22 Q. I'm not asking you to criticize the  
23 man individually. But in your role in this  
24 case, wouldn't you at least agree with me  
25 that he is not an accurate historian and

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1 that's the most charitable thing you can say?  
2 A. I would say it differently.  
3 Q. Say it differently how?  
4 A. When the brain is involved, as it  
5 was in this case, perhaps charity and then  
6 some is required.  
7 Q. Okay. Let's take another look at  
8 history. I'm going to ask you to look at the  
9 Centennial history and physical examination  
10 dated February 17th, 2016.  
11 MR. GIDEON: Miss, you can just go  
12 ahead and mark Dr. Callahan's copy of that  
13 and give it back to him.  
14 (Whereupon, the above-mentioned  
15 document was marked as Exhibit No. 6 to the  
16 testimony of the witness.)  
17 BY MR. GIDEON:  
18 Q. Have you seen this H and P from  
19 Centennial previously, Dr. Callahan?  
20 A. Yes, sir.  
21 Q. You can see from what was dictated  
22 by this hospitalist on February 18th and  
23 electronically signed February 21st of 2016  
24 that this man reported dizziness, slurred  
25 speech, facial muscle weakness, that he had

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1 been having those acute events with speech  
2 difficulty and facial weakness for the past  
3 month. And then in the fourth line up from  
4 the bottom, he says, "the patient woke up  
5 with the above listed symptoms."  
6 You saw that, right?  
7 A. I haven't found "the patient woke  
8 up." I was following you, but it's in that  
9 paragraph, right?  
10 MR. CUMMINGS: It's right there.  
11 THE WITNESS: Near the bottom? I  
12 got it. Yes.  
13 BY MR. GIDEON:  
14 Q. You see it? Now, the routine among  
15 physicians in the field with management of  
16 stroke is, if you wake up with these  
17 symptoms, your last normal is when you went  
18 to bed the night before, correct?  
19 A. Yes.  
20 MR. CUMMINGS: Object to the form.  
21 THE WITNESS: Yes.  
22 BY MR. GIDEON:  
23 Q. And what time did he go to bed on  
24 the night of February 16th, 2016?  
25 A. It's not in this note.

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1 Q. Just given the amount of  
2 information we've looked at so far, which is  
3 his deposition testimony, plus a note by  
4 Dr. Luck, and this H and P at Centennial, as  
5 well as your memory of the records at  
6 StoneCrest, when was Mr. Ruffino last normal  
7 on the morning of the 17th, 2016? When was  
8 he last normal?  
9 A. Well, the medical records at  
10 StoneCrest indicate he was normal that  
11 morning after he was seen there.  
12 Q. Right. That's one source. This  
13 reflects that he woke up on the morning of  
14 the 17th with facial muscle weakness,  
15 dizziness, and slurred speech. Do you know  
16 what time he normally arose?  
17 A. No.  
18 Q. Do you recall from his deposition  
19 that he normally got up well before 6:00  
20 because he started working at 5:30 to 6 a.m.,  
21 six days a week?  
22 A. I don't recall when he said in the  
23 deposition that he got up.  
24 Q. Okay. Bottom line then, is it may  
25 well have been that he was last normal



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1 whenever he went to bed the night before?  
2 MR. CUMMINGS: Object to the form.  
3 THE WITNESS: I think he was last  
4 normal a lot of times because of the nature  
5 of what he has in terms of pathology.  
6 BY MR. GIDEON:  
7 Q. The current definition of a TIA is  
8 what?  
9 A. Temporary neurologic dysfunction  
10 lasting less than 24 hours in which imaging  
11 is negative.  
12 Q. But we know that it's going to take  
13 at least six hours for a stroke to appear on  
14 a CT scan, correct?  
15 A. Yes.  
16 Q. How long will it take before a  
17 stroke appears on an MR?  
18 A. I don't think anybody knows, but  
19 it's much quicker. Much quicker.  
20 Q. Measured in hours, though, still?  
21 A. Probably under an hour, I think,  
22 with diffusion weighted capability.  
23 Q. All right. Hasn't the definition  
24 that you just gave us been altered?  
25 A. There have been suggested changes

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1 to it.  
2 Q. Well, the definition of 24 hours  
3 has been abandoned, wasn't it?  
4 A. Generally so.  
5 Q. Yeah. Why did you give me the 24  
6 hour definition, which was abandoned in 2004?  
7 A. Because it's still in our  
8 literature.  
9 Q. Okay. Well, isn't the current  
10 definition, the one that was adopted in 2004  
11 and did away with the 24 hour figure, one  
12 that says transient neurological changes for  
13 which there is no evidence of infarction?  
14 Isn't that the definition?  
15 A. Yes. It's become an imaging  
16 requirement rather than the time plus  
17 imaging. I gave you the time plus imaging.  
18 Q. Right.  
19 A. The truth of the matter is, the  
20 TIAs don't last 24 hours. They don't even  
21 last one hour.  
22 Q. Right. In this case, though, do  
23 you -- is it normally recommended that you  
24 attempt to do an endovascular embolectomy in  
25 a patient that has a TIA?

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1 A. I don't know of that  
2 recommendation. I mean, TIAs -- the reason  
3 we treat someone with TIA is to prevent the  
4 stroke, not because of the TIA.  
5 Q. Right.  
6 A. So if a patient had a TIA and has  
7 clot in the neck, the treatment is removal of  
8 the plaque in the neck.  
9 Q. In this particular case, though,  
10 we've got an individual who has -- and I know  
11 you haven't seen Dr. Efobi's entire set of  
12 notes, but you have seen a letter from  
13 Dr. Efobi to Dr. Luck. You have now seen,  
14 again, the Luck November 24, 2015 note. We  
15 know we have an individual who has had a  
16 series of TIAs, correct?  
17 A. Yes.  
18 Q. Is it your opinion to a reasonable  
19 degree of certainty that the series of TIAs  
20 are all originating from the stenosis shown  
21 on the 12/23/15 MRA?  
22 A. Yes.  
23 Q. And what is causing the events to  
24 occur against the backdrop of an otherwise  
25 static stenosis?

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1 A. Activated plaque.  
2 Q. And what is activating the plaque  
3 in each of these events?  
4 A. He must have some local disturbance  
5 of flow.  
6 Q. Could it be --  
7 A. And that's probably driven by  
8 platelet interactions with the plaque.  
9 Q. Could it be something as simple as  
10 changes in blood pressure?  
11 A. I don't think so.  
12 Q. Well, if we take somebody who has  
13 poorly controlled and long standing chronic  
14 hypertension, as you know he did, if their  
15 blood pressures are diminished, is that  
16 sufficient to diminish perfusion in areas of  
17 significant stenosis?  
18 A. For critical stenosis, it can.  
19 Q. Okay. And you know from looking at  
20 the MRA in this case that the level of  
21 stenosis is between more than 50 and less  
22 than 100?  
23 A. Correct.  
24 Q. Do we know whether he had a  
25 critical stenosis in the M1 branch of the



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1 left MCA based on the MRA?  
2 A. We know it based upon what he's  
3 doing clinically.  
4 Q. We know it's critical?  
5 A. Well, that there's activated plaque  
6 and he must have periods of less flow. In  
7 between, his flow must be adequate. So for  
8 ten minutes he has inadequate flow, and for  
9 the next hours or however long it is until  
10 the next event, he has adequate flow.  
11 Q. Okay. You testified in the Ferrion  
12 case, Dr. Callahan, another patient that had  
13 a series of TIAs, that, quote, these TIAs  
14 reflect something very bad is going to happen  
15 in the near term, end quote.  
16 What is it about sequential TIAs  
17 that reflects something very bad is going to  
18 happen in the near term?  
19 A. We think that TIA is a temporary  
20 manifestation of the stroke that will occur.  
21 Q. All right.  
22 A. And when plaques become activated,  
23 there is a window during which that stroke is  
24 likely.  
25 Q. What is the window?

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1 A. It's unknown. It's probably --  
2 Q. How do you even know there's a  
3 window if the duration is unknown?  
4 A. Do you really want me to tell you  
5 that?  
6 Q. No.  
7 A. I was afraid you'd say that.  
8 Q. I don't want a lengthy explanation.  
9 What I want is, how could you conceivably  
10 know there is a window if the duration itself  
11 is unknown? That makes no sense to me.  
12 A. I'm sorry.  
13 Q. I'm just being honest with you. A  
14 window implies some temporal relational or a  
15 spacial relationship?  
16 A. I've got it. It was quite sometime  
17 ago that the suggestion had been made that  
18 activated plaque in the carotid would cause  
19 stroke and that removal -- surgical removal  
20 of that plaque would prevent stroke. That  
21 suggestion was made in 1952 by Miller Fisher.  
22 In 1992, published in the New  
23 England Journal was the first scientific  
24 proof that angiographically proven stenosis  
25 greater than 70 percent in individuals with

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1 activated plaque, so they'd had TIA or minor  
2 stroke, endarterectomy was better than  
3 medical therapy for the prevention of stroke.  
4 This was a great step forward in medicine.  
5 When that trial was published, it  
6 was my expectation, not being a trialist,  
7 that all the group randomized to medical  
8 treatment immediately went and got stars  
9 placed on their neck for surgical removal of  
10 the plaques.  
11 In 1998, in the New England  
12 Journal, the same group that had done the  
13 NASCET study of severe carotid stenosis  
14 published their work for the 50 to 70  
15 percent, just severe without the capital S,  
16 carotid stenosis paper.  
17 In that paper in the New England  
18 Journal, they had a single graph of what had  
19 happened to the individuals in the original  
20 NASCET trial. And what they showed in the  
21 graph is that the surgical individuals had a  
22 seven percent risk of stroke at times zero  
23 because there was chance of causing the  
24 stroke in the operating room. And then  
25 immediately after that, the graph dropped and

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1 the risk of subsequent ipsilateral stroke was  
2 about one percent per year.  
3 The medical group, the other part  
4 of the graph, didn't go to the operating  
5 room. They still had their activated plaques  
6 angiographically proven, and for the first  
7 three years they were having strokes. And so  
8 the line started above the seven percent.  
9 And by year three, even though they had never  
10 had their plaques removed or had a balloon  
11 job on the plaques, they got to the one  
12 percent mark. And for the next six years, to  
13 1998, had a stroke rate equal to the same  
14 rate of stroke of the group that had their  
15 plaque surgically removed.  
16 Dr. Barnett, who published these  
17 two papers, had only a single paragraph in  
18 the New England Journal to torture those of  
19 us that like to read every page and look at  
20 every graph. But here he had suggested that  
21 activated plaques in a large artery, some of  
22 it became quiet after three years, the area  
23 under the curve.  
24 Because you might say, well, they  
25 all had a stroke. The answer was, 25 percent



<p style="text-align: right;">Page 73</p> <p>1 did. But 75 percent who never had the 2 operation never had an ipsilateral stroke. 3 And so it's just a phenomenon -- 4 Q. Now I see what you mean about the 5 window, though. It has a temporal feature to 6 it. 7 A. So within three years for the 8 carotid, if the plaque hadn't gotten you, it 9 seems like it's not going to get you. Why is 10 that? And Barnett never told us. 11 Q. Well, do you know? 12 A. We speculate, which isn't the same 13 as knowing, that in 1992 medical therapy for 14 the original NASCET trial consisted of 15 Aspirin, primitive blood pressure medicines 16 like Aldomet, blood thinners like Warfarin, 17 and there were no statins. That was the year 18 that Simvastatin, you know, first came on the 19 market after the publication of four S. 20 And Dr. Barnett never published if 21 these individuals in Canada and elsewhere 22 got -- now, ACE inhibitors, Lisinopril came 23 out that year -- got a statin, Simvastatin, 24 40 milligrams. Might have been given a super 25 Aspirin, you know, P2Y12 inhibitor like</p>	<p style="text-align: right;">Page 75</p> <p>1 there's a window in the 10 to 12 millimeter 2 internal carotid artery with activated 3 plaque. 4 Q. Well, you may not know this, then, 5 but Dr. Efobi saw this man in December of 6 2015, ordered the MRI and the MRA, and then 7 saw the patient again February 11th, 2016. 8 Did Dr. Efobi miss the opportunity 9 to prevent the stroke that you have said 10 occurred on -- sometime on February 17th, 11 2016? 12 A. As I mentioned to you earlier, I 13 never -- I have only the copy of his initial 14 dictation. 15 Q. Right. 16 A. There's nothing in Luck's notes 17 that indicate there's another visit. 18 Q. There are. 19 A. But I'm not provided that. 20 Q. Then you can't answer the question 21 of whether Efobi missed the opportunity to 22 prevent the stroke? 23 A. If you say I can't, then I can't. 24 Q. Well, can you? That's my question. 25 Whether you have the notes or not, can you</p>
<p style="text-align: right;">Page 74</p> <p>1 Clopidogrel. 2 I mean, the medical -- what 3 happened in the medical universe changed. 4 It's a great interest that in that same year, 5 1992, the plot of Americans beginning 6 hemodialysis with end stage renal disease hit 7 an inflexion point. And that inflexion point 8 has changed the slope. 9 So we theorize, though we don't 10 know, that medical treatment came of age. 11 And while some time ago you asked me about 12 numbers needed to treat with IV tPA, which is 13 12, not 3. 14 Q. Twelve to treat in order to benefit 15 one? 16 A. Yeah. For surgical endarterectomy 17 the numbers needed to treat are only seven. 18 That's a huge impact. Because of the 19 absolute reduction risk, not the relative 20 risk reduction. 21 So in this particular example, 22 there is likely to be a window in a 3 23 millimeter caliber blood vessel because the 24 middle cerebral artery stem is the same 25 caliber as the heart, just like we know</p>	<p style="text-align: right;">Page 76</p> <p>1 tell me that Dr. Efobi missed the opportunity 2 to prevent the stroke that you described as 3 occurring sometime around February 17, 2016? 4 A. Yeah. Optimal medical therapy was 5 not offered to this patient by the 6 neurologist at the initial visit. After 7 that, I don't know. 8 Q. What would have been the optimal 9 medical therapy to prescribe to John Ruffino 10 based on what is described in the thank you 11 for the referral note from Efobi back to 12 Dr. Luck? What should have been prescribed? 13 A. Dual antiplatelet therapy. 14 Intensive lipid lowering. 15 Q. Are you finished? 16 A. That's all that he could have 17 prescribed him. 18 Q. Okay. 19 A. He asked him to quit smoking, 20 apparently. 21 Q. Which he refused to do? 22 A. No one ever quits smoking. 23 Q. But you saw he was still smoking in 24 the dash cam when he's waiting for the 25 ambulance people to come pick him up, right?</p>

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1 A. I saw that. I saw him take out the  
2 cigarette and light it with his right hand.  
3 Q. What's dual antiplatelet theory?  
4 A. Oh, I'm sorry. Clopidogrel plus  
5 Aspirin.  
6 Q. And intensive lipid lowering would  
7 be a statin?  
8 A. Yes. It would require Atorvastatin  
9 40 or 80 milligrams or Rosuvastatin 20 or 40  
10 milligram. None of the other statins or  
11 doses of those drugs that would be lower  
12 would have been adequate.  
13 Q. Okay. Do you have an opinion as to  
14 the likelihood that this man would have still  
15 had a stroke on or around February 17, 2016  
16 if those medications had been prescribed and  
17 if the patient had taken them after the first  
18 visit with Dr. Efobi?  
19 A. I don't know how long of a runway  
20 you need for those drugs to have been  
21 confident that risk would have been reduced.  
22 Q. You cannot say to a reasonable  
23 degree of medical certainty that it would  
24 have prevented the stroke?  
25 A. Correct. We have a study called

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1 SAMMPRIS that I'm sure you're aware of. And  
2 in that study, medical treatment as I  
3 outlined just to you proved superior to  
4 ballooning and stenting in patients that were  
5 having recurrent TIAs and no stroke.  
6 Q. In this particular case, have you  
7 had a chance to look at the MR of February  
8 18th, 2016?  
9 A. I have.  
10 Q. What I would like to do now is to  
11 switch gears and compare the 12/23/15 MRI and  
12 the 2/18/16 MR. I know that your laptop is  
13 equipped with the software necessary to look  
14 at the images. You're free to look at that,  
15 if you wish, again. Alternatively, you're  
16 free to look at your notes. It's your  
17 choice. But I want a comparison of the  
18 two --  
19 A. The study that was done before was  
20 a CT -- I'm sorry. It's an MR.  
21 Q. It is an MR.  
22 A. Yeah.  
23 Q. 12/23/15 --  
24 A. Got you.  
25 Q. -- and 2/18/16.

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1 A. Right.  
2 Q. You're free to look at notes.  
3 You're free to look at the images again.  
4 Your choice. But tell us what you see.  
5 A. I'd refer to my note, which is part  
6 of Exhibit 2.  
7 Q. Okay. Tell us what you see  
8 February 18th, 2016.  
9 A. So that study was obtained at 2018  
10 hours at Centennial Medical Center. And it  
11 showed restricted diffusion that was patchy  
12 involving the deep left hemisphere and the  
13 subinsular regions. It also showed changes  
14 in the left temporal gyral pattern and left  
15 high frontal gyral pattern.  
16 In addition to restricted diffusion  
17 abnormalities on DWI, the flare sequences  
18 were positive in the same locations. The  
19 gradient sequence showed no evidence of micro  
20 hemorrhage.  
21 So this -- these changes were new  
22 that had occurred between the prior 12/23/15  
23 MR and the MRI at Centennial.  
24 Q. Do you agree that the MR of  
25 February 18th, 2016 shows diffused cerebral

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1 cortical loss?  
2 A. No, I don't agree with that.  
3 Q. You know that's in the --  
4 A. May be in a report, but I don't  
5 agree with that.  
6 Q. -- dictated report by the  
7 physician?  
8 A. No.  
9 Q. You do not agree with it?  
10 A. No. What I thought about the scan  
11 is what I told you.  
12 Q. I understand.  
13 A. It's not a full dictated report  
14 like the radiologists do.  
15 Q. Do you agree the February 18th,  
16 2016 MR shows -- on diffusion imaging shows  
17 patchy infarcts in the left basal ganglia?  
18 A. That's what I just told you. I  
19 agree with that.  
20 Q. Okay. Do you agree that that also  
21 shows -- that study shows embolic infarcts in  
22 the left frontal lobe?  
23 A. Yes. I told you that, too. High  
24 frontal. And also left temporal.  
25 Q. And in the left occipital lobe as

<p style="text-align: right;">Page 81</p> <p>1 well?</p> <p>2 A. Well, that's really temporal but --</p> <p>3 I would say temporal.</p> <p>4 Q. All right. Does that make it more</p> <p>5 likely than not that there was embolic</p> <p>6 reduction of perfusion in a number of</p> <p>7 different sites?</p> <p>8 A. I think --</p> <p>9 Q. Or is there -- what I'm getting at,</p> <p>10 is there a single pathway to reduction of</p> <p>11 perfusion more likely than not?</p> <p>12 A. So I think the activated plaque in</p> <p>13 the mid portion of the M1 segment on the left</p> <p>14 involved penetrating vessels to the basal</p> <p>15 ganglia. And the stroke event was one where</p> <p>16 there was not subsequent reperfusion in the</p> <p>17 deep basal ganglia.</p> <p>18 As part of the flow, no flow, flow,</p> <p>19 no flow TIA episodes until the penultimate</p> <p>20 one that was the stroke, there must have</p> <p>21 distal migration of very small clots that</p> <p>22 accounted for the change in the gyrus and the</p> <p>23 high left frontal region and left temporal</p> <p>24 region that you point out the reader called</p> <p>25 the left occipital region.</p>	<p style="text-align: right;">Page 83</p> <p>1 Q. Between four to ten, depending upon</p> <p>2 how you count them?</p> <p>3 A. Yeah. I don't know how to count</p> <p>4 because patients may have more than they</p> <p>5 count.</p> <p>6 Q. Right.</p> <p>7 A. In terms of the tissue, we know we</p> <p>8 went from no tissue damage to tissue damage.</p> <p>9 In terms of imaging, we know we went from an</p> <p>10 artery that had plaque that now is an artery</p> <p>11 that seems to show that there isn't flow by</p> <p>12 the time he gets to Centennial and they do</p> <p>13 their studies.</p> <p>14 As to whether the changes seen on</p> <p>15 the MRI are all from one episode or more than</p> <p>16 one, I don't -- I don't know the answer to</p> <p>17 that. I know that if these changes were</p> <p>18 there before, they weren't seen on the CT</p> <p>19 scan at StoneCrest or seen on the CT -- part</p> <p>20 of the CTA at StoneCrest. But we know that</p> <p>21 that study has sort of a blind area of about</p> <p>22 six hours.</p> <p>23 Q. Right.</p> <p>24 A. This study is done the next day, in</p> <p>25 the evening of the next day. I mean, it's</p>
<p style="text-align: right;">Page 82</p> <p>1 Q. Right.</p> <p>2 A. So the mechanism is activated</p> <p>3 plaque with a local disturbance of flow of</p> <p>4 penetrators and distal small emboli. These</p> <p>5 are really small emboli.</p> <p>6 Q. Do you --</p> <p>7 A. And they had to get there because</p> <p>8 there had to be flow that took them there.</p> <p>9 They couldn't have gotten there with</p> <p>10 collateral flow.</p> <p>11 Q. But let's make sure that we all</p> <p>12 understand what you're saying, Dr. Callahan.</p> <p>13 Do you think there were episodes of embolic</p> <p>14 movement here that led to inadequate</p> <p>15 perfusion of certain areas of the brain, or</p> <p>16 was there just one episode?</p> <p>17 A. We don't know.</p> <p>18 Q. Okay. Over what period of time</p> <p>19 could there have been several episodes that</p> <p>20 are consistent with what you see on the</p> <p>21 February 18th, 2016 MR with the baseline you</p> <p>22 have of the 12/23/15 MR?</p> <p>23 A. So between the 12/23/15 MR and this</p> <p>24 MR, he had, I think, several episodes that we</p> <p>25 know of.</p>	<p style="text-align: right;">Page 84</p> <p>1 not done quick --</p> <p>2 Q. Right.</p> <p>3 A. -- in terms of his being at</p> <p>4 Centennial because he got there on the 17th.</p> <p>5 Q. But we also know that CT scan</p> <p>6 versus the MRI have differing levels of</p> <p>7 sensitivity and specificity, too, don't they?</p> <p>8 A. That's correct. We've talked about</p> <p>9 that.</p> <p>10 Q. So they're not just a perfect</p> <p>11 apples to apples comparison?</p> <p>12 A. Well, they're just imaging studies.</p> <p>13 Q. Correct. But they don't</p> <p>14 necessarily see the same things the same way</p> <p>15 is what I'm getting at?</p> <p>16 A. Well, the CT will have</p> <p>17 perspicacity, just you have to wait a little</p> <p>18 bit. The MRI will see it early.</p> <p>19 Q. Right.</p> <p>20 A. And so, in this case, by the time</p> <p>21 the MRI sees it, they didn't do another CT.</p> <p>22 He'd had the CTs at StoneCrest that didn't</p> <p>23 see it, didn't see it. And between CT1 and</p> <p>24 the CTA was, you know, four hours.</p> <p>25 Q. Right.</p>



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1 A. So the fact that the first one  
2 didn't see it doesn't mean that the next one  
3 couldn't see it. But by 1409, it didn't see  
4 it. As to when it happened, it's hard to  
5 know. Because at StoneCrest, you know, he's  
6 normal or he's not, he's normal or he's not.  
7 Even after they call a code stroke he  
8 continues to have what appears to be  
9 intermittent adequate flow and then brief  
10 periods where there's not adequate flow.  
11 Q. Right. It appears that he is  
12 continuing to have a TIA or TIAs at  
13 StoneCrest; isn't that right?  
14 A. Correct. Yeah. I don't think he's  
15 had the stroke when he gets there because  
16 he's recorded as normal in the morning. And  
17 when they do a code stroke, I think  
18 Dr. Archer might have found him in the middle  
19 of one of the episodes or in some part of the  
20 episode.  
21 And then I think in my affidavit I  
22 go to the time point that's around 1900 hours  
23 or sometime thereafter that no one ever  
24 records a normal exam after that point. You  
25 know, by then, the clinical event has

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1 occurred.  
2 Q. Now, in this particular case,  
3 though, still focusing on the MR, you have  
4 some disagreement with the physician who  
5 actually interpreted the study and dictated  
6 the report. You don't see diffused cerebral  
7 cortical loss on that particular MR?  
8 A. Well, I didn't look at it for  
9 whether there was atrophy in this particular  
10 individual.  
11 Q. Well, then you might agree with  
12 that if you looked at it again?  
13 A. It's not helpful for me thinking  
14 about him in terms of activated plaque in the  
15 left M1 segment.  
16 Q. You do agree that the diffusion  
17 imaging shows patchy infarcts in the left  
18 basal ganglia?  
19 A. Yes. It --  
20 Q. Now, when did the infarction occur  
21 in the left basal ganglia to a reasonable  
22 degree of medical certainty?  
23 A. Yeah, we don't know.  
24 Q. Why not? Why not know?  
25 A. Well, the perspicacity of that

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1 image, the diffusion weighted image is two  
2 weeks.  
3 Q. So it could have been at any time  
4 two weeks prior to 2/18/16, correct?  
5 A. In theory, but I don't think that's  
6 right. And the reason is, is that that  
7 stroke would have been seen on the CT. And  
8 the CT at 1027 and 1409 didn't see it.  
9 So I think in terms of imaging  
10 there are brackets to know that that change  
11 is going to be when he has now clinical  
12 events just like he's always had, but now  
13 they persist.  
14 Q. All right.  
15 A. And we don't know exactly when that  
16 happened. But it's clear that by 1927 or so  
17 he's no longer having an exam where people  
18 say, well, he's normal to me now.  
19 Q. However, in terms of putting the  
20 parameters on the timeframe, we know what's  
21 apparent on February 18th, 2016 in the  
22 evening when the MR is done. We also know  
23 the CT scan is sensitive to identify the  
24 changes up to six hours before the imaging.  
25 So we know in this case that it goes back to

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1 two hours before the original CT, if we use  
2 the CTA as the most sensitive up to the time  
3 of the MR?  
4 A. Well, now your question presumes  
5 that he could have the basal ganglia stroke,  
6 but be asymptomatic, that that just happens  
7 to be an incidental thing. And I don't know  
8 that that's the case.  
9 Q. Well, what would be symptomatic of  
10 a permanent injury in the left basal ganglia?  
11 A. Yeah. I would expect that if it's  
12 big enough he would have weakness involving  
13 the right face and right arm, with or without  
14 involvement of the right leg. And that the  
15 speech would be thick. But, again, it has to  
16 be big enough.  
17 Q. But we know he has had repeated  
18 episodes of weakness in the right face, thick  
19 speech. We just don't know how long they've  
20 lasted, do we?  
21 A. Well, I think Valdivia said they  
22 were stereotypic episodes. They're all the  
23 same. And he pegged them between 10 and 14  
24 minutes, if that can be relied upon.  
25 Q. Well, how long does it require for



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1 us to have inadequate perfusion in the basal  
2 ganglia before there is permanent injury to  
3 the tissue? How many minutes of inadequate  
4 perfusion?  
5 A. Yeah. I don't know the answer to  
6 that.  
7 Q. You couldn't because it's a  
8 function, isn't it, of how inadequate the  
9 perfusion is for how long?  
10 A. And there are more variables than  
11 that.  
12 Q. As well as the metabolic demand of  
13 the tissue?  
14 A. And more variables than that.  
15 Q. Right. The bottom line is, it's an  
16 unknowable answer, isn't it?  
17 A. Correct.  
18 Q. Okay. Likewise, you agree that  
19 there are embolic infarcts in the left  
20 frontal lobe. When did those occur?  
21 A. Yeah. I don't know when.  
22 Q. And whether it's the left temporal  
23 lobe or left frontal lobe, left occipital  
24 lobe, whatever the point, you don't know when  
25 those occurred either, do you?

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1 A. No. But I'm -- I'm very  
2 parsimonious in thinking, and given that the  
3 DWI is positive and so is flare, I think all  
4 of these things run together rather than  
5 saying, there was a little one that went to  
6 the left temporal lobe, and then some unknown  
7 delta passes and goes to the high left  
8 frontal lobe and then there's another delta  
9 time and now we've got patchy change in the  
10 DWI.  
11 Clinically, I think that he has an  
12 event at StoneCrest for which that's the  
13 stroke. And the imaging that they have at  
14 Centennial on the next day evening makes it  
15 look like that's the stroke. That fits very  
16 nicely.  
17 Q. What's the size of the infarct as  
18 shown on the MR of February 18th? How big is  
19 it?  
20 A. I don't know the volume. And  
21 neither did the reader provide a volumetric  
22 measure.  
23 Q. Right. Were you able to measure  
24 the size of the infarct core lesion yourself?  
25 A. I did not attempt.

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1 Q. Can you do that?  
2 A. It would be difficult because it's  
3 patchy. I know how to do that, but I didn't  
4 attempt to do that measure.  
5 Q. Now, did you do an ASPECTS score on  
6 this particular study?  
7 A. I don't do ASPECTS on MRs, only CT.  
8 Q. How about the size of the penumbra  
9 on the MR February 18th, 2016, could you make  
10 an assessment of the impaired, but not  
11 infarcted tissue?  
12 A. No. The CT perfusion study did  
13 that, which was done earlier in the day on  
14 the 18th at Centennial.  
15 Q. Right. Well, we'll turn to that  
16 right now. There's another perfusion scan  
17 February 18th, 2016. Have you had a chance  
18 to actually look at that yourself?  
19 A. Yes. That was done at 1247 hours.  
20 Q. What was the size of the penumbra?  
21 A. The area of diminished perfusion is  
22 quite large and looks like all of the middle  
23 cerebral artery territory on the left.  
24 Q. Okay. Compare that with the  
25 ischemic core?

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1 A. It's much smaller. So there's a  
2 diffusion perfusion mismatch. Those are the  
3 cases we look for because we can intervene by  
4 providing flow and hit home runs rather than  
5 bunts.  
6 Q. Right. So when you have a mismatch  
7 with the ischemic core and a large penumbra,  
8 that's one of the things where it's an  
9 opportunity to intervene, right?  
10 A. Where we should go to the cath lab.  
11 Q. Right. You don't cease that  
12 opportunity by giving the patient intravenous  
13 tPA, though?  
14 A. Well, it's allowed that you could  
15 give them tPA, but you need to be headed to  
16 cath lab while you're infusing the drug.  
17 Q. Okay.  
18 A. But these are the cases that -- the  
19 large vessel occlusions that we live for. I  
20 mean, all the systems have to primed to -- on  
21 the lookout for these cases to want to do  
22 these.  
23 Q. Well, was there still an occlusion  
24 as of the time the perfusion scan was run?  
25 A. It doesn't give you any data about



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1 that, only that flow is diminished. So you  
2 presume that the activated plaque must still  
3 be activated. As to how much flow might be  
4 there, I don't know the thresholds for how  
5 they set their device to calculate how much  
6 residual flow could be present.  
7 Q. Well, I want to make sure that  
8 we're communicating. Isn't it true that the  
9 perfusion scan does not identify any complete  
10 occlusion?  
11 A. I don't know how it could identify  
12 a complete occlusion. It's just perfusion.  
13 So there's reduced perfusion throughout the  
14 left MCA, and read by Dr. Lassiter.  
15 Q. Right. Do you know Dr. Lassiter?  
16 A. Very well.  
17 Q. He's a very talented, capable guy,  
18 isn't he?  
19 A. He is that.  
20 MR. GIDEON: Mark this, please.  
21 (Whereupon, the above-mentioned  
22 document was marked as Exhibit No. 7 to the  
23 testimony of the witness.)  
24 BY MR. GIDEON:  
25 Q. What I'm interested in is the

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1 report by this talented, capable individual  
2 we both know.  
3 In his findings he says,  
4 Dr. Callahan, "There is decreased mean transit  
5 time and time to peak throughout the left  
6 middle cerebral artery distribution." Point  
7 here being, that is the technique used to  
8 identify the penumbral tissue, correct?  
9 A. Right.  
10 Q. All right. And that penumbral  
11 tissue is in the perisylvian left frontal,  
12 temporal and parietal lobes, correct?  
13 A. That's what he wrote.  
14 Q. Okay. Then he says, "There is  
15 relatively normal cerebral blood flow and  
16 cerebral blood volume."  
17 Was there, in fact, an occlusion in  
18 the left MCA M1 branch at the time this  
19 perfusion scan was done?  
20 A. Yeah. He doesn't know.  
21 Q. Do you, from looking at it  
22 yourself?  
23 A. No. No. But that would be a good  
24 question for you to ask Dr. Lassiter.  
25 Q. His impression is decreased

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1 perfusion, then he describes the areas. Then  
2 he goes on to say, "without evidence of  
3 ischemia at this time."  
4 What had relieved the occlusion by  
5 the time the perfusion scan was done at  
6 Centennial on the 18th at noon?  
7 A. Do you mean, how did it happen?  
8 Q. Yeah.  
9 A. Well, assuming that his study means  
10 that there's now TIC1 3 flow, which I don't  
11 believe it does, but that's something to ask  
12 him rather than myself. We know that with  
13 activated plaque there can be spontaneous  
14 flow again, and maybe that happened.  
15 Q. Well, what I'm asking you to do is  
16 take your background and your experience, and  
17 as you look at the report and you also have  
18 the benefit of having looked at the perfusion  
19 scan images themselves, was there evidence of  
20 ischemia at the time of the perfusion scan to  
21 your eyes?  
22 A. It's only a perfusion study for me,  
23 not an ischemia test.  
24 Q. Okay. You're not in a position,  
25 then, to disagree with his conclusion that

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1 there was no evidence of ischemia at the time  
2 the study occurred?  
3 A. No.  
4 Q. Okay. Similarly, is one potential  
5 explanation for the absence of ischemia that  
6 the occlusion had been lysed in some fashion  
7 on its own?  
8 A. Well, against that theory is what  
9 we learn with the MRI later that evening. So  
10 maybe he was flowing at this instant, which I  
11 don't believe. And I don't believe  
12 Lassiter's report really means that, if you  
13 ask him, as compared to that it's still  
14 occluded.  
15 Q. Well, what would explain it if, in  
16 fact, that is his point?  
17 A. You should ask him so he could  
18 explain it.  
19 Q. All right. But what was the  
20 point --  
21 A. Because I can't explain what he's  
22 trying to tell you.  
23 Q. Okay. You have had access to the  
24 entire Centennial record, and there are  
25 several notes here by people you know. I'll



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1 give you a copy of Ron Wilson's note of  
2 February 20th.  
3 MR. GIDEON: We'll make this the  
4 next exhibit.  
5 (Whereupon, the above-mentioned  
6 document was marked as Exhibit No. 8 to the  
7 testimony of the witness.)  
8 BY MR. GIDEON:  
9 Q. And I'm not going to force you to  
10 race through the note, but if I'll look to  
11 the third page, you'll see this is a note  
12 that was electronically signed by Ron Wilson  
13 at 11:00 on February 20th, 2016.  
14 In that, at the top in the free  
15 text assessment and plan he states, "Problem  
16 number one, complex left middle cerebral  
17 artery hypoperfusion syndrome due to partial  
18 occlusion of MCA vessels."  
19 Now, is there anything on the  
20 imaging up to and including the 20th that  
21 supports the conclusion that there was  
22 partial occlusion of the MCA vessels?  
23 A. No.  
24 Q. Is there anything about the  
25 clinical findings up to and including

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1 February 20th that support Dr. Wilson's  
2 statement that there is a partial occlusion  
3 of the MCA vessels?  
4 A. Yeah. I would have said it  
5 differently. He records the stroke scale  
6 score of 3.  
7 Q. Correct.  
8 A. On admission, the stroke scale  
9 score was 13. And so his presumption is that  
10 the patient has gotten better because there's  
11 been restoration of flow. And I hate to  
12 speak for him, but that would be what I would  
13 imagine he was thinking.  
14 Q. Okay.  
15 A. He didn't articulate because of the  
16 NIH stroke scale score going from 13 to 3,  
17 with the above mentioned imaging, this is my  
18 opinion. He just simply wrote that is --  
19 what he wrote. This is what he's typing.  
20 Q. Right. Dr. Callahan, for a person  
21 to be accurately 13 on the NIH stroke scale  
22 and then for it to be 3 48 hours later,  
23 doesn't there have to be intervening  
24 perfusion?  
25 A. By some means, I would think.

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1 Q. Yeah. How would you otherwise go  
2 from a 13 to 3, assuming both are accurately  
3 calculated, unless there has been restoration  
4 of perfusion?  
5 A. You know, I'm a flow guy. But the  
6 other -- my other stroke colleagues think  
7 that there can be other things that go on  
8 having to do with excitotoxicity, various  
9 somatic things that happen.  
10 Q. What do you think?  
11 A. This particular man got  
12 Minocycline, which is thought to maybe  
13 provide some sort of benefit in terms of  
14 neuro resuscitation. But I'm -- but I'm  
15 still a flow guy. So I think there must have  
16 been some way to get augmented flow.  
17 Q. How did that happen?  
18 A. Only God knows.  
19 Q. If we presume that a flow guy is  
20 right, how did flow get restored in this case  
21 so as to improve the NIH stroke scale from 13  
22 to 3 without endovascular intervention and  
23 without intra-arterial or intravenous tPA?  
24 How did that happen in this particular case?  
25 A. Yeah. I don't know.

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1 Q. All right. What's the exhibit  
2 number on Dr. Wilson's note?  
3 A. I think it's 9.  
4 THE COURT REPORTER: It's 8.  
5 BY MR. GIDEON:  
6 Q. You will recall from looking at the  
7 record that Dr. Valdivia's plan of care was  
8 to permit permissive hypertension, to keep  
9 the patient in bed frequently with the head  
10 down. And it worked pretty well, didn't it?  
11 A. Well, that's what he did. Whether  
12 it's the reason that things changed or not,  
13 I've always been skeptical of the blood  
14 pressure guys.  
15 Q. Okay. It's a school of thought  
16 that you have some skepticism about?  
17 A. Yes.  
18 Q. I'm not trying to turn this into a  
19 personal comparison --  
20 A. No, no, no, no.  
21 Q. -- between you and Dr. Valdivia,  
22 but is it a school of thought difference that  
23 you have some skepticism about permissive  
24 hypertension?  
25 A. I have some skepticism about it.



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1 Q. All right. Well, then,  
2 fundamentally?  
3 A. And the reason is that patients can  
4 get better and it doesn't have anything to do  
5 with what we did.  
6 Q. Well, is that what happened here,  
7 in your opinion?  
8 A. He may have gotten better because  
9 of part what they did do in terms of Aspirin  
10 and Clopidogrel and maybe some of the other  
11 medical treatments made a difference. We  
12 don't know.  
13 Q. To a reasonable degree of medical  
14 certainty then, you can't say even with the  
15 benefit of hindsight why Mr. Ruffino  
16 improved, correct?  
17 A. Correct.  
18 Q. All right. He discharged on  
19 February 26 for the first occasion.  
20 MR. GIDEON: This is Dr. Valdivia's  
21 note of February 26.  
22 (Whereupon, the above-mentioned  
23 document was marked as Exhibit No. 9 to the  
24 testimony of the witness.)  
25 THE WITNESS: This is the discharge

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1 note?  
2 BY MR. GIDEON:  
3 Q. Yeah. This is the note by  
4 Dr. Valdivia on the 26th.  
5 A. And do you have his NIH stroke  
6 scale number? Because it says one of four,  
7 so there's more to the note than what you've  
8 given me.  
9 Q. Well, I don't. You've got the  
10 chart. You're free to look at it, if you  
11 wish.  
12 A. I only have an electronic version  
13 of the chart, so...  
14 Q. Okay. Well, I don't have the NIH  
15 stroke scale with me. The individual is  
16 ambulating on his own. He's able to speak,  
17 able to dress himself, able to eat, able to  
18 do all these things. What --  
19 A. Well, it doesn't say those things,  
20 but --  
21 Q. I know from looking at the rest of  
22 the chart that he was able to do that on the  
23 26th. He walked out of the hospital, was  
24 able to talk to people. He was going up and  
25 down the hallways, eating normal food,

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1 dressing himself, doing all those things.  
2 Did you not see that when you looked at the  
3 chart yourself?  
4 A. I don't recall that part. I recall  
5 seeing an NIH stroke scale score of 6, which  
6 is why I was keen to know if you had had the  
7 other sheets.  
8 Q. I don't. Why did this man get to  
9 the point where he's able to speak normally,  
10 able to walk, able to dress himself, able to  
11 eat and walk out of the hospital on the 26th,  
12 to a reasonable degree of medical certainty?  
13 MR. CUMMINGS: Object to the form.  
14 THE WITNESS: Because he only had a  
15 small stroke rather than a big stroke.  
16 BY MR. GIDEON:  
17 Q. Okay. What assurance does he have  
18 as he walks out on the 26th that he's not  
19 going to have a recurrence of TIAs or another  
20 big stroke?  
21 A. He has no assurance.  
22 Q. What's the probability as this man  
23 walks out of the hospital on the 26th that he  
24 will have a large stroke at sometime in the  
25 future?

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1 A. It's very good.  
2 Q. Meaning what? Put a number on it.  
3 A. More likely than not.  
4 Q. Okay. Why?  
5 A. Because they hadn't fixed the  
6 problem.  
7 Q. And what would you have to do to  
8 fix the problem?  
9 A. Eliminate the activated plaque.  
10 Q. How do you do that?  
11 A. You'd have to use the cath lab.  
12 Q. And would you take the activated  
13 plaque out of the vessel?  
14 A. No, not in the MCA. Typically, at  
15 this institution in the old days it was done  
16 by balloon angioplasty without placement of a  
17 stent.  
18 Q. So in order to minimize the more  
19 probable than not likelihood of a future  
20 major stroke, this man needed to have a PTCA?  
21 A. That's what I would have  
22 recommended for him.  
23 Q. And given the fact that it's 2016  
24 instead of 2018, would it have been limited  
25 to a PTCA or would a stent have been placed?



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1 A. Well, in the old days in another  
2 century at that institution, more than 120  
3 patients were treated and only one ever had a  
4 stent placed. And that stent was placed in  
5 the vertebral basilar artery system in order  
6 for rescue. And there was a paper published  
7 about 127 patients in that series by Berger  
8 and myself, as well as the endovascular  
9 rescue with stent placement because it was  
10 the first placement of an endoprosthesis  
11 intracranially in the world.  
12 Q. Okay. But what about this man,  
13 what would have been done, stent or PTCA  
14 alone?  
15 A. Just balloon angioplasty and  
16 medicines.  
17 Q. Why hasn't he had a major stroke  
18 since then?  
19 A. He did have another stroke.  
20 Q. But he went home?  
21 A. Came back again with more trouble.  
22 Q. Right.  
23 A. And a much higher NIH stroke scale  
24 score.  
25 Q. He went home and he fell down in

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1 the bathroom, according to him. Did you see  
2 his history about that?  
3 A. Yes.  
4 Q. He then got progressively worse and  
5 waited 15 hours before he came back to the  
6 hospital. Wasn't it a failure to act  
7 reasonably on his own part to wait 15 hours  
8 before returning to the ER?  
9 A. We think patients need to come  
10 quickly to help.  
11 Q. Well, answer the question, then,  
12 Dr. Callahan. In order to exercise  
13 reasonable care for his own health, safety,  
14 and welfare, shouldn't he have returned to  
15 the hospital much sooner than 15 hours after  
16 the index event?  
17 A. Sure. He should have come  
18 immediately back to care.  
19 Q. Okay. And if he had done so, would  
20 there have been the opportunity to perform a  
21 PTCA and either place a stent or elect not to  
22 place a stent?  
23 A. There might have been.  
24 Q. Okay. What is the timeframe within  
25 which percutaneous intervention may occur

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1 following the event?  
2 A. In what year?  
3 Q. 2016, February of 2016.  
4 A. In that year and in that artery it  
5 was six hours, although some of the trialists  
6 went out to eight.  
7 Q. But no more than eight?  
8 A. Yes, no more than eight.  
9 Q. All right. The trials usually  
10 attempt to measure outcomes based on death at  
11 some point in time, incidents of intracranial  
12 hemorrhage, and a measurement of function,  
13 frequently the Modified Rankin Score of the  
14 goal being between zero and two, correct?  
15 A. I would have said it differently.  
16 But the outcomes are prescribed for the trial  
17 before the trial is conducted.  
18 Q. Correct.  
19 A. And the benefit in the more recent  
20 studies is a Modified Rankin Score at 90 days  
21 between zero to two.  
22 Q. Okay. That's what I'm getting at.  
23 Modified Rankin Score between zero and two is  
24 a measurement of functional independence,  
25 isn't it?

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1 A. Yes.  
2 Q. It doesn't mean that you don't have  
3 any limitations, right?  
4 A. It would if you had a score of  
5 zero.  
6 Q. Correct.  
7 A. But the definition of benefit is  
8 those with zero and those with one and those  
9 with two.  
10 Q. Okay. What is the level of  
11 functional independence with a Modified  
12 Rankin Score of one? What is it that's  
13 limited, impaired, or disabled?  
14 A. Yeah. They have -- they have some  
15 disturbance of function and they can't use a  
16 walker.  
17 Q. Cannot use the walker?  
18 A. Yeah. I mean --  
19 Q. They're in a wheelchair?  
20 A. Yeah -- no, no, no. They don't  
21 need a walker or anything like that.  
22 Q. Don't need a crutch?  
23 A. I think they can have a stick.  
24 They can't use the walker.  
25 Q. Okay.



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1 A. And for a two, they can use a  
2 walker, but it cannot have wheels.  
3 Q. Okay. Do you know if Mr. Ruffino  
4 is able to ambulate without assistance?  
5 A. I don't know the answer to that.  
6 Q. If he is able to ambulate without  
7 assistance, able to communicate, able to  
8 dress himself, does he have a Modified Rankin  
9 Score of one or two?  
10 A. I'd have to see him.  
11 Q. You would?  
12 A. And probably somebody that has seen  
13 him might have used those scales.  
14 Q. What about incompetence of speech,  
15 some people refer to it as dysarthria?  
16 A. We call that thickness of speech.  
17 Q. Yeah. If we use the term  
18 "thickness of speech," and that is the only  
19 limitation, where does that fall on the  
20 Modified Rankin Score?  
21 A. I presume by that you mean that he  
22 has no aphasia.  
23 Q. Right.  
24 A. So it's just his speech is thick.  
25 He can think and remember, knows what things

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1 are, can name those things, can write, can  
2 read, it's just simply he has dysarthria.  
3 Q. And is not articulate, somewhat  
4 slow, where does that fall on the MR -- the  
5 Modified Rankin Scale?  
6 A. And that he's able to chew and  
7 swallow without impairment?  
8 Q. Yeah.  
9 A. Yeah. That would be a one.  
10 Q. What about limited handwriting  
11 skill on the ipsilateral side and --  
12 A. Contralateral?  
13 Q. Contralateral side, yes. Limited  
14 handwriting ability on the contralateral side  
15 and some thickness of speech together, is  
16 that a Modified Rankin Score of two, but  
17 otherwise able to ambulate?  
18 A. Yeah. It's going to be close to  
19 two. You know, we actually -- it's been  
20 modified subsequently so there can be 1.5s as  
21 opposed to 1s.  
22 Q. Well, where would you assess him on  
23 the Modified Rankin Scale when he left  
24 Centennial on February 26th?  
25 A. I was hopeful that Dr. Valdivia

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1 might have done that as part of his exit note  
2 or it might be in the discharge summary,  
3 since they're contemporaneous and know how  
4 he's doing things. And that's why I wanted  
5 to know what they said. I would be unable to  
6 come up with a number with what you've shown  
7 me here. And I'm sure that must be somewhere  
8 in the record.  
9 Q. Okay. I want to talk to you about  
10 the ESCAPE trial. The full name of the study  
11 was the "Endovascular treatment for Small  
12 Core and Anterior circulation Proximal  
13 occlusion with Emphasis on minimizing CT to  
14 recanalization times," fortunately called  
15 ESCAPE.  
16 A. Its' ESCAPE IA.  
17 Q. Do you recall that it required an  
18 NIHSS of greater than five to be included in  
19 that study?  
20 A. No. I would look at the New  
21 England Journal article again. But since you  
22 probably have it before you, I'm confident  
23 with your report.  
24 Q. It also required to be included  
25 moderate to good collateral circulation

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1 defined as filling 50 percent or more of the  
2 middle cerebral artery pial arterial  
3 circulation, correct?  
4 A. Again, I trust you with the  
5 recitation.  
6 Q. In your opinion, did this man have  
7 on any of the imaging studies you saw 50  
8 percent or more of the MCA artery pial  
9 arterial circulation supported by good  
10 collateral circulation?  
11 A. I'd ask the imagers that question.  
12 Q. You don't know and don't have an  
13 opinion?  
14 A. No, because they didn't conduct the  
15 studies that they did in ESCAPE to arrive at  
16 that.  
17 Q. Okay. In that study, the mortality  
18 at 90 days was 10.4 percent in the  
19 intervention group. What were the principal  
20 causes of death among those patients placed  
21 in the endovascular intervention?  
22 A. I'd have to look at the article to  
23 tell you.  
24 Q. Okay. Do you recall that the  
25 lowest NIHSS for endovascular intervention



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1 was 13? Among all the patients actually  
2 included the lowest was 13?  
3 A. No. They wanted, you know, severe  
4 strokes. And, typically, that's somewhere  
5 north of 10 that we start thinking about the  
6 NIH stroke scale score as a surrogate for  
7 severity. And they probably excluded ones  
8 above 25 because those are too severe.  
9 Q. With respect to the control group,  
10 which is shown on table 1, the lowest NIH  
11 stroke scale was 12. Did you know that?  
12 A. No. But they want to have a  
13 homogenous group because they randomize these  
14 individuals.  
15 Q. Okay. Turning to SWIFT PRIME,  
16 which is another study you brought up, the  
17 "Solitaire FR with the Intention for  
18 Thrombectomy as Primary Endovascular  
19 Treatment of Acute Ischemic Stroke," SWIFT  
20 PRIME. The NIH stroke scores range from 8 to  
21 29 in that study. Did you recall that?  
22 A. No. But I'm delighted that they  
23 included people up to 29.  
24 Q. The -- you will recall that this  
25 was one the studies that had a particular

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1 target mismatch profile that was required,  
2 correct?  
3 A. It required, actually, rapid  
4 software, which had been developed at  
5 Stanford and was only available at certain  
6 select centers.  
7 Q. Correct. Using that special  
8 software, they had to have an ischemic core  
9 lesion that was not greater than 50  
10 milliliters, no more than 100 milliliters of  
11 tissue, with time to maximum delay of greater  
12 than 10 seconds and a mismatch ratio that  
13 exceeded 1.8, correct?  
14 A. I trust you with your recitation.  
15 Q. What was the size of the ischemic  
16 core lesion in Mr. Ruffino?  
17 A. It was not measured by any of the  
18 contemporary radiologists, neither was it  
19 calculated by me. As we spoke before, those  
20 calculations that could have been made by me  
21 are not the same as the rapid numbers that  
22 you mentioned in that trial.  
23 Typically, the rapid numbers, the  
24 ABC/2 rule, which is what we use, generates  
25 numbers that are a little lower in terms of

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1 tissue volume for infarction than the rapid  
2 software.  
3 Q. Okay. Now, in this particular  
4 study of those that were randomized to just  
5 intravenous tPA alone, the -- that group of  
6 people that got to the Modified Rankin Score  
7 of zero to 2, only 35 percent of those. Do  
8 you recall that?  
9 A. I trust you.  
10 Q. Okay. And then, last, the  
11 "Extending the Time for Thrombolysis in  
12 Emergency Neurological Deficits  
13 Intra-Arterial," also known as EXTEND-1A?  
14 A. IA.  
15 Q. IA. They split the participants  
16 between intravenous tPA only or IV tPA and  
17 endovascular therapy with a stent retriever,  
18 correct?  
19 A. Yes.  
20 Q. A mismatch ratio of greater than  
21 1.2 required in this case and an absolute  
22 mismatch volume of greater than 10  
23 milliliters, an infarct core lesion of less  
24 than 70 milliliters as assessed by the rapid  
25 software. Do you recall what the results

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1 were in that study for those that got IV tPA  
2 alone?  
3 A. I'm sure you'll tell me, but it  
4 exceeded 50 percent.  
5 Q. No. It was less than 50 percent.  
6 IV tPA alone on 37 percent.  
7 A. I'm sorry. For endovascular  
8 exceeded 50 percent. I don't know the IV tPA  
9 number.  
10 Q. Okay. Is there anything else  
11 that's underway right now, any other trial  
12 underway right now, Dr. Callahan, that  
13 compares to ESCAPE, SWIFT PRIME, or  
14 EXTEND-IA?  
15 A. Well, there are a number of ongoing  
16 studies for acute stroke.  
17 Q. Any expected to be releasing their  
18 results shortly before our trial in January?  
19 A. The MR CLEAN boys are busy trying  
20 to see if IV tPA is necessary.  
21 Q. With endovascular care?  
22 A. That rather than being at a center  
23 that can't do the cath lab and then staying  
24 there to get IV tPA before you go to the cath  
25 lab, if that's a reasonable program. But



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1 the -- that study, I don't know where they  
2 are with enrollment or when they plan to  
3 report out. They did not report out at the  
4 recent stroke meeting in LA in February.  
5 Q. Okay.  
6 A. And there was really not much talk  
7 about it, and there shouldn't have been much  
8 talk about it.  
9 Q. All right.  
10 A. But that's going to be the next.  
11 Q. The next horizon, then, is whether  
12 to eliminate use of intravenous tPA and just  
13 proceed directly to endovascular  
14 intervention?  
15 A. Yes. And -- and the issue that's  
16 implicit in that is, how do you figure out in  
17 the periphery that it's large vessel  
18 occlusion so they need to go quickly to the  
19 cath lab somewhere else or they should get IV  
20 tPA because it's not a large vessel. And in  
21 Holland, they may have an easier way to do  
22 that because the country is so small.  
23 But in America, that's going to be  
24 the issue with whatever they tell us,  
25 whatever they've learned scientifically, what

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1 does that mean for how we're going to care  
2 for people in a massively sized country where  
3 endovascular capability is only in certain,  
4 you know, centers.  
5 Q. Currently, tPA is not approved by  
6 the FDA for intra-arterial use, correct?  
7 A. That's correct.  
8 Q. Has the intra-arterial  
9 administration of tPA been pushed by the  
10 wayside? Been there, done that, is that  
11 the --  
12 A. Well, it was never tPA. The  
13 studies were done without tPA, was done with  
14 an agent that never made it to FDA approval  
15 because there was one study that was positive  
16 that Berger and I were part of called PROACT  
17 II published in 1999.  
18 I don't know of any intra-arterial  
19 tPA studies going on, even though it's still  
20 an arrow in the quiver, I think, for rescue.  
21 The new guys, the young ones, are very, very  
22 quick with these Solitaire stent retriever  
23 devices.  
24 So what Berger used to do in six  
25 hours, they do in 15 minutes. It's

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1 phenomenal. Just because of the difference  
2 in the technology. And I think that's why  
3 it's become so good.  
4 But they haven't learned how to  
5 rescue all of those patients. It doesn't  
6 always work. And there's issue with, you get  
7 reperfusion, so TICI 2B or 3, but yet  
8 something happened in the microcirculation.  
9 And for that, there still may be a place for  
10 the administration of lytic therapy for the  
11 smaller clots that are still there in the  
12 microcirculation.  
13 So while it is true in the  
14 guidelines, they seemingly are irreverent of  
15 the old guys that did work in the last  
16 century with catheters, of which I'm one  
17 speaking to you. There may be something  
18 about our technique that will be useful even  
19 for the new jet flyers.  
20 Q. Well, the reason I ask that is that  
21 there is a specific statement in the 2015  
22 guidelines that emphasizes that  
23 intra-arterial use of thrombolytics is not  
24 approved by the FDA, and it doesn't spend any  
25 time talking about when that option should be

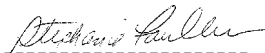
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1 considered, recommending consideration of  
2 that option. That's why I asked if it's --  
3 time has passed as far as the leading  
4 thinkers in the field?  
5 A. Well, not thinking that I'm  
6 leading, the guidelines that you had had us  
7 review were developed very, very quickly  
8 after the stroke meeting that happened to be  
9 in Nashville in February of '15, because MR  
10 CLEAN had been published in December '14.  
11 And it was a sea change in terms of  
12 the leading minds at that time. So very,  
13 very quickly in January of '15, you know,  
14 this quick recitation of lightning had  
15 struck, the Earth had shaken, there was  
16 something new to do. And the other studies  
17 had all been stopped once MR CLEAN was  
18 published in the New England Journal. Those  
19 studies were far from incomplete. Even  
20 though they were stopped prematurely, they  
21 were all positive.  
22 Q. Right.  
23 A. And so once the guideline group had  
24 a chance to rewrite the guidelines, which  
25 took them until late 2017, though the current



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1 2018 guidelines do speak a bit irreverently,	1 SIGNATURE OF DEPONENT
2 but say there's still scientific reason to do	2 I, ALFRED CALLAHAN, III, M.D., do
3 what the old dinosaurs like me did in another	3 hereby certify that I have read the foregoing
4 century. So I'm grateful that their memory	4 deposition transcript and find it to be a
5 has returned.	5 true and accurate transcription of my
6 MR. GIDEON: Dr. Callahan, always	6 testimony, with the following corrections, if
7 good to see you. Thank you very much for	7 any:
8 answering my questions.	8
9 THE WITNESS: The pleasure is mine,	9 PAGE LINE CHANGE
10 sir. It's great to see you again.	10 _____
11 MR. WITT: I don't have any	11 _____
12 questions.	12 _____
13 MR. CUMMINGS: No questions.	13 _____
14 (Whereupon, the above-mentioned	14 _____
15 document was marked as Exhibit No. 10 to the	15 _____
16 testimony of the witness.)	16 _____
17 (Whereupon, the deposition was	17 _____
18 concluded at approximately 3:06 p.m.)	18 _____
19	19 _____
20	20 _____
21	21 _____
22	22 _____
23	23 _____
24	24 _____
25	25 Alfred Callahan, III, M.D.

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1 C E R T I F I C A T E
2
3 STATE OF TENNESSEE )
4 )
5 COUNTY OF RUTHERFORD )
6
7 I, STEPHANIE A. FAULKNER, LCR, CRI,
8 CPE, CERTIFY:
9 The foregoing proceedings were taken
10 before me at the time and place stated in the
11 foregoing styled cause with the appearance as
12 noted.
13
14 Being a Court Reporter, I then
15 reported the proceedings in Stenotype, and
16 the foregoing pages contain a true and
17 correct transcript of my said Stenotype notes
18 then and there taken.
19
20 I am not in the employ of and am not
21 related to any of the parties or their
22 counsel, and I have no interest in the matter
23 involved.
24 I FURTHER CERTIFY that this
25 transcript is the work product of this court
reporting agency and any unauthorized
reproduction AND/OR transfer of it will be in
violation of Tennessee Code Annotated
39-14-104, Theft of Services.
Witness my signature, this, the 20th
day of April, 2018.

Stephanie A. Faulkner, LCR, CRI, CPE
LCR No. 323, Expires June 30, 2018